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# Interfaces of Nearness: Documentary Photography and the Representation of Technology

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## **Abstract**

The central aim of this dissertation is to provide insights into the ways in which documentary photography, in theory and practice, create and sustain critical dialogues surrounding the production of knowledge via technology. The first chapter proposes a framework for examining technology via its relationship to scientific inquiry and the production of knowledge through instrumentation. These relationships are examined from the diverse perspectives of social constructivism, the philosophy of technology, the philosophy of science, and media studies. I propose that a consideration of the relationship between the camera's function in the scientific laboratory and in the visual arts can provide unique insights into its utility as a tool of visual representation, and that a diversity of perspectives is needed to understand the applications of the camera as a tool for representing technology today. In chapter 2, I explore the problematic of visualizing technology via photography, an inherently visual medium, because of the way that contemporary technologies are progressively hidden via the unintelligible forms of techno-objects. I propose that a variety of photographic strategies are necessary, varying in both their aesthetic and political coherence, in order to represent such a multifaceted and challenging to visualize phenomenon. Referencing Alexander Galloway's theory of Interfaces, I categorize the varied attempts at representing technology via documentary photography into four distinct categories: ideological documentary, ethical documentary, poetic documentary, and radical documentary. Each category alone offers a unique opportunity to construct new forms of visual knowledge regarding technology, but they are most useful if used collectively to describe our physical and social-technological landscapes. Finally, I present an artistic body of work titled *A Human Laboratory*, together with an introduction that explores the relationship between the above theoretical discourses and the artistic practice of documentary photography.



**Keywords**

Photography, documentary, technology, fine art, black-boxes, interfaces, Galloway, inscription machines, technological representation, simulation, Heidegger.

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“The world is not a solid continent of facts sprinkled by a few lakes of uncertainties, but a vast ocean of uncertainties speckled by a few islands of calibrated and stabilized forms.”<sup>1</sup>

— Bruno Latour

## Preface

The central aim of this dissertation is to provide a framework for understanding the ways in which photography, in theory and as artistic practice, can be utilized to create and sustain critical dialogues surrounding the production of knowledge via technology. To achieve this goal, however, it is first necessary to examine how instruments are employed through various means in the production of knowledge *and* photography’s ingrained relationship to tools of discovery. It is critical, therefore, to focus on the methods and tools that visualize and record abstract but related data, which are then analyzed to construct meaning in some form or another. Scientific inquiry is examined as a primary example of such a social practice. It employs instruments of increasing abstraction to record and analyze data and shares many similarities with (as it is directly related to) the artist’s camera. Rooted in the tenets of relentless discovery, scientific activity is primarily concerned with the pursuit of new knowledge, and is deeply dependent on technology to that end. While other institutions whose primary function is to produce and collect data via technological instruments exist (for example, large corporations logging data on millions of users as they move through space and time), none has the historical significance nor the instructive capacity found within the institutions of science.

An understanding of how knowledge is “produced” with the aid of instruments is a necessary precursor to the production component of my thesis and thus plays a pivotal role in the first chapter of this dissertation. How instruments are used within a laboratory to form the basis of what we call a fact, introduces vital concepts of social construction, and relevant discourses on the increasingly

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<sup>1</sup> Bruno Latour, *Reassembling the Social: An Introduction to Actor-network-theory* (Oxford: Oxford University Press, 2005), 245.

malleable nature of technology-aided knowledge. The output of instruments analyzed by scientists and circulated to the non-scientist likewise introduces several questions meriting further discussion, such as how the “raw” data from an experiment is eventually re-coded into a digestible visual format for the non-scientist. The reception of science’s dissemination by the non-scientist is also reviewed, as it is often complicated by the sheer volume of data being produced and the speed at which discoveries are being announced; all due to significant technological advancements within in the past several decades.

The first chapter identifies a *visual* problem. An analysis of relevant cultural, theoretical, and philosophical concepts provides the necessary support to identify the production of knowledge via technology, at least in part, as a challenge for visual representation. As techno-instruments are increasingly employed to advance our understanding of the world, it is worthwhile investigating the aggregate burden placed on decoding their increasingly abstracted forms (as objects) and visual symbols (as outputs of such objects). This enquiry, therefore, emphatically points toward the critical role that the humanities, and the visual arts more specifically, can play in questioning the influences that such objects, and the cultural shifts they create, have on our lives.

“Inscriptions and Simulations” (1.2) outlines the scale at which, and the methods by which, new data is being produced via scientific inquiry. It also draws on concepts brought forth by Bruno Latour and Jean Baudrillard to grapple with how “inscription devices” produce specialized codes that both aid in the production of knowledge within, *and* distort our understanding of, the world. “Abstracting Forms” (1.3) introduces both the “black-box” effect increasingly present in instrumentation used inside *and* outside of science, and Martin Heidegger’s notion that such technologies might be better understood as forms of mediation rather than simply as physical tools. Shifting the conversation from physical tools to mediation marks an important step toward locating technology and knowledge production as social and cultural phenomena, and carving out the space necessary to discuss it within an artistic framework. Only such a framework, as Heidegger suggests, can reveal the

true “essence” of technology.<sup>2</sup> In “Contemporary Technologies and Interfaces” (1.4), I further explore the entanglement of technology and knowledge production in our social landscape. Alexander Galloway’s theory of Interfaces provides a useful tool for decoding the signifiers hidden within the abundance of visual data that various inscription devices produce daily. The theory of Interfaces is usefully framed within a spectrum of politics and can be applied within modes of production as diverse as science and art, setting up an extended conversation to be tackled in the second chapter. “Philosophies of Science” (1.5) briefly introduces some contemporary analyses of what constitutes scientific knowledge and how that knowledge is formed. Several texts are mined for their embrace of radical and unconventional methods of knowledge production in science, which can often be applied to artistic contexts as well due to the instrumental connections that tend to exist between both practices. Arguments from perspectives such as feminism and integrated pluralism call for a continuous expansion of our traditional and static forms of knowledge production, which can later be applied to the practice of artistic production and documentary photography.

Scientific and technical instruments are not relegated to the laboratory, and their dual function as instruments of artistic production continues to reveal new ways of understanding their capacities not only as instruments of discovery but also as tools with the potential to drastically alter the physical and cultural world around them. A dialogue between a camera used in a laboratory and one used by an artist might present an enlightening discourse, particularly within a documentary framework. In a moment where the speed and growth of techno-instruments can easily outpace our insight and reflection upon them, artistic production and visual analysis can offer a truly unique and insightful perspective, in a moment of visual confusion.

Chapter Two introduces the notion that the artist’s camera, when used in a documentary mode of production, can help to answer some fundamental questions about technology, like how techno-instruments can evolve in function drastically

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<sup>2</sup> Martin Heidegger, “The Question Concerning Technology,” in *The Question Concerning Technology and Other Essays*, transl. William Lovitt (New York: Garland Publishing, 1977), 3.

over time, and how instruments like the camera should not necessarily be relied upon to reveal absolute truth. Alexander Galloway's theory of Interfaces introduces a vocabulary that functions neatly within the discourse of documentary photography, and the multifarious functions of the photographic instrument when used within a contemporary context. "Ideological Documentary" (2.2) explores the way in which the photographic camera remains a useful tool for revealing the physical ramifications and manifestations of technology within the physical landscape. However, its utility in contemporary culture is opposed by the "black-box" effect (the tendency of techno-objects to embody a form that does not visually reveal any of its functions) that contemporary technology increasingly embodies. "Ethical Documentary" (2.3) explores photographic attempts to reform the camera as an apparatus with many functions, that should not be limited in its attempts at representation, and that can be used to wrestle some control from dominant and hegemonic visual regimes. The insights that this documentary approach provide are not only useful as a tactic for redefining the accepted norms of technologies like the photographic camera, but also are instructive for reflecting on how malleable and political contemporary technology has become. "Poetic Documentary" (2.4) analyzes how contemporary documentary photography can function in symbolic and metaphorical ways, while remaining firmly grounded in the real. This mode is primarily explored as an approach that can reference contemporary forms through photographs and make unexpected visual connections amongst them, primarily via the interpretive nature of aesthetic representation. Such an approach becomes necessary as the form/function relationship of our visual world tends to deteriorate as technological functions expand. Finally, the section precariously labelled "Truth or Radical Documentary" (2.5) explores the relatively abstracted notion of an "ideal" of representation. When the limits of the artist's camera have been identified, documentary photography can offer new and enlightening questions concerning technological representation, and perhaps bring some new forms of visual knowledge to the fore.

The third and final chapter presents the visual and artistic work produced in conjunction with this written dissertation. The project discussed within reflects

upon many of the notions explored above but primarily exist in partnership with it. The work by no means seeks to answer or address, with any finality, the many questions and concerns raised throughout this thesis; however, it is meant to introduce a body of work that at once falls within the category of documentary photography, but that also seeks to expand its limits, hopefully providing novel strategies towards the visual representation of technology. It is here presented in excerpts of an artist's monograph and supplemented by documentation of other related exhibitions; however, it has and will continue to exist outside of such a space. The power of contemporary documentary photography lies not within its inherent limitations, of which it has many, but rather, it lies within its incredibly diverse and *expanding* functionality as an incredibly relevant, technological tool.

## **1.0 INSCRIPTION MACHINES AND THE PRODUCTION OF KNOWLEDGE VIA TECHNOLOGY**

### **1.1 INTRODUCTION**

The focus of this chapter is the identification of a visual problem through the analysis of several diverse spheres of knowledge. Though this multidisciplinary approach may be somewhat limited in its depth, it serves to introduce the notion that considering technology and its ramifications inevitably requires many methodologies. By considering technology simultaneously as instruments in a laboratory, a social construction with cultural ramifications, objects that have become progressively less visualizable, a way of understanding ourselves, an interface that influences perception and understanding, and a source of knowledge and its boundaries, it becomes apparent just how diverse technology is. The theories and methodologies introduced here ground the following discussions in a productive dialogue. As such, this chapter is not so much a literature review, but more accurately a “collecting ground” for what follows, including the significant body of artistic work that complements this dissertation and the analysis of documentary photographic forms.

### **1.2 INSCRIPTIONS AND SIMULATIONS**

Understanding the degree to which scientific institutions rely on various forms of technology to produce new knowledge is a challenge. In fact, it would be difficult to identify in the past several centuries any pursuit for new knowledge in which technological instruments did not play a key role, and none if we include rudimentary tools of recording such as scrapers and stones. For example, buried 330 feet beneath the border of Switzerland and France, stands an instrument called the Large Hadron Collider (LHC), the world's largest particle collider. Annually, it consumes seven hundred gigawatt-hours of energy and over one billion dollars in

the attempt to unlock the fundamental physics of the universe.<sup>3</sup> More than ten thousand researchers, engineers, and students from sixty countries on six continents contribute to the LHC's six standing projects. At the core of this instrument are detectors, such as calorimeters and muon spectrometers, that record with incredible precision what happens when particles smash together at fantastic speeds. These detectors record, process, and store, 600 million events per second, and along with other instruments at the Centre for Nuclear Research (CERN), produce 70 *petaflops* of data annually.<sup>4</sup> Far away in Chile, the Atacama Desert is home to another large group of instruments, where scientists observe, via an array of over fifty mobile telescopes, millimeter and submillimeter wavelengths that are theoretically capable of providing insight on star births at the beginning of the universe, along with detailed imaging of local star and planet formations. The Atacama Large Millimetre Array (ALMA) relies on a robust supercomputer to convert the data it collects into more manageable digital information. Even tracking the migrations of fish in a controlled lake at the Experimental Lakes Area (ELA) far to the north in Kenora, Ontario, requires sophisticated GPS tracking technology, as well as software to compile coherent data for scientists to further their investigations. With such sophisticated instruments at work, clearly it is not a matter of *whether* technology has been used to discover new scientific knowledge, but rather to what extent it has been used to do so and what influence it has on generating this new knowledge.

Many investigators and theorists consider the roles that such a variety of scientific instruments play within the production and dissemination of new knowledge. Bruno Latour, for example, applies a sociological perspective to what is actually being produced in the scientific laboratory:

“[P]articular significance can be attached to the operation of apparatus which provides some kind of written output. Of course, there are various items of apparatus in the laboratory which do not have this function. Such "machines" transform matter between one

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<sup>3</sup> "Budget overview: Media and Press Relations," *CERN: Accelerating Science*, accessed February 03, 2017, <https://press.cern/facts-and-figures/budget-overview>.

<sup>4</sup> "Computing," *CERN: Accelerating Science*, accessed February 3, 2017, <https://home.cern/about/computing>.

state and another. [F]or example...a rotary evaporator, a centrifuge, a shaker, and a grinder. By contrast, a number of other items of apparatus, which we shall call "inscription devices," transform pieces of matter into written documents. More exactly, an inscription device is any item of apparatus or particular configuration of such items which can transform a material substance into a figure or diagram which is directly usable by one of the members of the office space.<sup>5</sup>

Latour's description relies on interpreting the scientist's collaboration with "inscription devices," which can be described as recording instruments designed for the specific purpose of measuring some phenomenon or occurrence in the laboratory, and must be accurate and consistent in their measurements over time. Thus, inscription machines mediate between scientist and subject, and have become increasingly necessary as the inquiries scientists perform have become progressively more complex and abstract.<sup>6</sup> The observance of most, if not all, phenomena in science today, depends entirely on inscription machines of various sorts to confirm findings. From the many detectors attached to the aforementioned LHC, to an ageing scale tucked away in a high school biology lab, tools are needed for observers to reference, confirm, and attribute their claims. Once an experiment is established, the observer must wait for an instrument to reveal tangible data that can then be recorded in some visual mode, which can then be stored on another device, typically a computer. Since few experiments would be considered sound with only one sampling of data, instruments must be utilized multiple times to ensure the credibility of both the technology and the consistency of its output, and only then might this data be offered as evidence of some phenomenon. Confirmation, or the construction of a fact, in Latour's accounting, is therefore entirely social, only occurring after others with expertise have begun referencing without question to claims brought forth via repeatable experimentation.<sup>7</sup>

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<sup>5</sup> Bruno Latour, *Laboratory Life: The Construction of Scientific Facts* (Princeton, NJ: Princeton University Press, 1986), 71.

<sup>6</sup> This statement refers to management of increasing quantities of data through instruments capable of producing more calculations and inscriptions, and the assumption that with every increase in computing power and refinement of past instruments, more data can be gathered and analyzed faster than ever.

<sup>7</sup> Latour, *Laboratory Life*: 71.



As will be highlighted throughout this thesis, there are many resemblances linking various detectors in science to those of the artist's camera. If we define the camera as a technological instrument that captures some physical phenomenon occurring in space and time, encoding and then translating it to another medium, the conceptual difference from, for example, a detector measuring the energy of atoms, becomes one of form rather than of generic function. While not all detectors and instruments used in science share an obvious similarity to the photographic camera (say the computer, for instance), the introduction of digital photography and its current reliance on electronic computation diminish this gap. Such similarities do not end here, however. Latour writes, "[a]n important consequence of this notion of inscription device is that inscriptions are regarded as having a direct relationship to the original substance."<sup>8</sup> This notion of "direct relationship" applies equally to scientific instruments *and* the photographic camera via their indexicality; that is, both have a startling capacity to embody what we have come to regard as "facts" or some form of indisputable facticity.

However, the outputs of inscription devices are but "*presentations* of reality as configured or coded or written," as Rosalind Krauss suggests upon reflecting on the photographic image.<sup>9</sup> Indeed, examining scientific instruments through the lens of photographic and artistic practice (and vice-versa) can produce a unique perspective on the malleability of the "facticity" of an inscription, and information post-translation via the re-coded data inherent in every act of recording. Within photography, we can and often do consider the framing, technological intervention, political stake, motivations, and overall intentions of the photographer taking a photograph. Most importantly, such ways of understanding the photograph are learned over great lengths of time and are constantly challenged. The production of meaning via technological instruments within artistic practice has always relied on contextualization, questioning, and experimentation. While the institution of science has, throughout its history, produced very robust methods for addressing the

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<sup>8</sup> Ibid., 51.

<sup>9</sup> Rosalind E. Krauss, *L'Amour Fou: Photography and Surrealism* (Washington, D.C.: Corcoran Gallery of Art, 1985), 35. Emphasis added.

construction of facts *internally*, the notion of values, politics, and power have not been so transparent, and have only recently been questioned.<sup>10</sup>

Further, the increasing reliance on the abstracted forms and processes of “techno-instruments” (to be explored in more depth shortly) when producing “raw data” within scientific inquiry leads to representational obstacles.<sup>11</sup> For example, a scale has a tangible and tacit relationship to the material world that can be understood directly through practice and interaction.<sup>12</sup> Even so, a scale may gradually lose accuracy over time, be manipulated by a third party, or its values might be recorded incorrectly by a user. If we consider the scale as a type of camera, it leads to new questions, as even a simple tool requires much contextualization and has the potential to distort output. As such, a patent protected computer program that translates a given sensor’s analysis of, for example, genetic material, is even less tacit as knowledge, and less directly linked to the human body in both form and function.<sup>13</sup> This means that the potential for misleading or unanticipated data also grows in tandem with these decreasingly tacit forms of knowledge, as an operator of such an instrument has restricted knowledge of the instrument they are interacting with (in its internal operation and whether or not it is functioning correctly). Further, the choice of what data is worth recording, what is “fundable” research, and how personal politics within the laboratory effect experimental outcomes, all provide critical points for contemplating the validity and facticity of inscriptions. All of these concerns undermine the seemingly indexical relationship between

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<sup>10</sup> Heather Douglas, “Rejecting the Ideals of Value Free Science,” in *Value-Free Science? Ideals and Illusions*, eds. Harold Kincaid, John Dupre and Alison Wylie (Oxford: Oxford University Press, 2007), 121.

<sup>11</sup> Geoffrey C. Bowker convincingly argues against any notion that “raw data” exists, which is why it appears in quotations here. His arguments align with the concept that Levi Strauss introduces regarding the “natural” and the “social,” and how data can simply not exist without some human intervention, and thus cannot be considered as “raw” in any way (referring to it instead as “cooked”). See: Geoffrey C. Bowker, “Data Flakes: An Afterword to ‘Raw Data’ Is an Oxymoron,” in “‘Raw Data’ Is an Oxymoron” (Cambridge, MA: MIT Press, 2013), 168.

<sup>12</sup> Michael Polanyi, *The Tacit Dimension* (Chicago: University of Chicago Press, 2009), 4.

<sup>13</sup> The notion that knowledge can become less “tacit” refers to Michael Polanyi’s categories of explicit and tacit knowledge. In *The Tacit Dimension*, tacit knowledge is expressed as a form of knowledge that is impossible to articulate only by verbal means, such as a skill or personal experience. Relying on a machine to provide data, with no understanding of its function, might then be considered an ever more abstracted form of knowledge than the tacit. See: Michael Polanyi, *The Tacit Dimension* (Chicago: University of Chicago Press, 2009).

instruments and their eventual inscriptions, or at least raise questions regarding our social capacity to cognize such a vast array of mechanisms while probing for an objective fact. Very recently, technologies incorporating “machine intelligence” have even begun to process information in ways that humans inherently do not have the *capacity* to understand fully, and the speed of technological advances can generate entirely “new behavioural regime[s] as humans lose the ability to intervene in real time.”<sup>14</sup> An awareness of the growing abstraction of technological tools and commands, while it can be and often is routinely explored in cultural and artistic practices, is rarely addressed or even acknowledged within the scientific community.<sup>15</sup>

Jean Baudrillard, through his theories of simulacra and simulation, amplifies these concerns further within cultural and philosophical contexts. His ideas are often cited in philosophy and cultural theoretical contexts addressing phenomena such as advertising and television broadcasts, where signs and signifiers have progressively throughout the twentieth century lost any referent in the “real” world. Baudrillard defines “simulacra” as copies that depict things that either has no original to begin with, or that no longer have an original, and “simulation” as the imitation of the operation of a real-world process or system over time.<sup>16</sup> For example, within a scientific context, it is easy to imagine the data collected from the Large Hadron Collider as having no original to begin with; its data coming into reality is essentially a construction that can at best estimate, via the exponentiation of complex symbols, a representation of the otherwise unrepresentable. The fourth and final stage of Baudrillard’s breakdown of the sign-order describes a simulacrum as having no relationship to any reality whatsoever.<sup>17</sup> Signs merely reflect other signs, and any claim to reality is born only of other claims. It is a thought exercise to consider scientific production under this rubric.

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<sup>14</sup> Stephan Marsland, *Machine Learning: An Algorithmic Perspective* (New York: Chapman & Hall/CRC press: 2015), 5; Neil Johnson, “Abrupt rise of new machine ecology beyond human response time,” *Scientific Reports* 3 (2013): 2627.

<sup>15</sup> This is discussed further in Section 1.4: “Philosophies of Science”.

<sup>16</sup> Jean Baudrillard, *Simulacra and Simulations* (Chicago: University of Chicago Press, 1994), 3-7.

<sup>17</sup> Which occur after (1) the faithful image/copy, (2) the perversion of reality, and (3) the masking of the absence of reality. *Ibid.*, 3-7.

For Baudrillard, however, this final regime is one of total equivalency. Cultural products (we may include science here as well) need no longer pretend to be real in a naïve sense because the experiences of a consumer's life are so predominantly artificial that even claims to reality are expected to be phrased in artificial, "hyperreal" terms.<sup>18</sup> The term hyperreal seems rather fitting when discussing the output of the LHC, all things considered. Vilém Flusser extends this notion by considering images as mediations that "obscure," rather than represent the world, until "human beings' lives finally become a function of the images they create."<sup>19</sup> He considers photographs as "abstractions of a third order" that are inherently more codified than "traditional" pre-technological images, and warns about the danger of regarding technical images as objective. As Flusser proposes, it "is not the world out there that is real...only the photograph is real."<sup>20</sup> In other words, reality is no longer a useful way of describing the world, as we rely wholly on artificial constructs and symbologies to describe it.

This conclusion has clear ramifications for consumers and institutions that rely on the capture of coded phenomena via mediating technologies in the search for enlightened/objective truth. The further we mine for "truth" using increasingly abstracted technological instruments, the further entrenched we must become in the signs and simulations we use to describe it. Therefore, we must become comfortable with analyzing and questioning those signs carefully. While representations emerging from scientific endeavour (via press coverage and public relations) are apparent visual examples of points of possible misrepresentation, contemplating Baudrillard's notions puts even the practice of performing science into philosophical contention with its internal *raison d'être*. How is it possible to *come closer* to our subject through greater abstraction?

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<sup>18</sup> Ibid., 6.

<sup>19</sup> "Ontologically, traditional images are abstractions of the first order insofar as they abstract from the concrete world while technical images are abstractions of the third order. They abstract from texts which abstract from traditional images which themselves abstract from the concrete world." Vilém Flusser, *Towards a Philosophy of Photography* (London: Reaktion Books, 2000), 10.

<sup>20</sup> Ibid., 14-5, 37.

### 1.3 ABSTRACTING FORMS

The inscription machines that scientists employ have grown steadily in scale and sophistication since the Enlightenment. Their functions are multiple, from recording data using sensors to processing unorganized data via computation, and finally to the reintroduction of some form of legible information and its eventual dissemination. Scientific instruments, therefore, can no longer be symbolized (or visualized) by traditional forms of representation. They do not assume the visage of a beaker or a measuring stick, nor merely a series of convex mirrors redirecting beams of light. They have donned a fluid and nearly indiscernible presence within our social and cultural landscapes, often spilling outside of what we would consider the traditional laboratory.<sup>21</sup> A further layer of complication is added when we consider the tendency of such instruments to become “black-boxes” when employed in fields of research and knowledge production.

The functions that occur inside black-boxes are inherently invisible to the observer; such instruments are designed to accept input and render output based on unseen calculations. Even the simplest of cameras, like the large-format view camera, operate in this way. While they function to simplify workflow (or perhaps hide proprietary algorithms), black-box instruments do so at the expense of transparency between form and function. As a relevant example, if we consider the increasing reliance on computing in every domain of scientific and technological understanding, withholding the computer source code critical to understanding and evaluating computer programs renders significant portions of research uninterpretable at the site of research.<sup>22</sup> The above is a concern if knowledge is considered a social construction because it limits the ability to develop a history or philosophy of technology. Furthermore, there is a strong tendency to regard

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<sup>21</sup> For example, the SETI project uses a network of home computers provided by the interested public to help analyze an abundance of collected data in the search for alien signals from space. Also, curing cancer has been “gamified” to allow “players” to help analyze real genetic data. See: Larry Greenemeier, “Play to Cure: Genes in Space,” *Scientific American*, February 18, 2015, accessed March 24, 2018, <https://www.scientificamerican.com/citizen-science/play-to-cure-genes-in-space/>.

<sup>22</sup> A. Morin, *et al.*, “Shining Light into Black-boxes,” *Science* 336, no. 6078 (2012): 159.

technology and instruments as the lesser and less meaningful relatives of science, and because science deals with the fundamentals of human knowledge, it has historically been considered the more valued and significant topic.<sup>23</sup> However, can we continue to regard the instruments that produce knowledge as *less* integral than the act of investigation, particularly if the investigation cannot be done without instruments?

One example of instrumental reliance is the images regularly published by NASA produced by distant telescopes showing wildly colourful galaxies, which eventually function as representations of the objective real. However, the true form of a galaxy in any experiential and even visual sense varies wildly from these instrumental representations. The telescopes that collect such data just happen to be our *only* source of such images, and the only way we have of visualizing such distant phenomena. The images they produce must be manipulated before publication, as images from telescopes are often taken through three different colour filters, which must then be combined using software and a human hand to enhance their legibility and understanding.<sup>24</sup> Without such manipulation, the images would only be legible to experts in the field, leaving discoveries inaccessible to those not versed in the highly coded scientific language; however, this further distortion in order to make legible becomes rather ironic when considering the chain of symbolic understanding that must be navigated by the observer of the final image.

All instruments and technologies introduce symbols (whether or not they are capable of producing *images*) that significantly alter perceptions of the world around us. Even some of the earliest tools humans produced (for example, fire and stone tools) significantly altered the way we perceive time and space. The illuminated darkness and the speed of tooled-production are simple examples of paradigm shifts in perception realized through technology. As instruments become more complex and coded, however, we come to rely more heavily on their symbolic

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<sup>23</sup> Langdon Winner, "Upon Opening the Black-box and Finding it Empty: Social Constructivism and the Philosophy of Technology," *Science, Technology, & Human Values* 18, no. 3 (1993): 365.

<sup>24</sup> Mike Wall, "Conspiracy Debunked: NASA Photoshops Images for Good Reason," *Space.com*, October 15, 2010, accessed March 24, 2018, <https://www.space.com/9337-conspiracy-debunked-nasa-photoshops-images-good-reason.html>.

output rather than understand their inner workings. In this way, the black-box can be understood as a metaphor for the challenge of understanding inherent or hidden complexity; where it is unreasonable for a majority to have specialist knowledge of countless symbolic languages.

Historically, as early as 1919, Dr. Viktor Tausk employed the term black-box when referring to unintelligible technological devices that his patients would refer to when speaking of their illness. His schizophrenia patients described their reality as influenced by the imprinting of images onto their brains by such “alien” devices. Patients further described an inability to determine the images produced by such remote and malignant machines from their own. Further research concluded that such images produced physiological responses, regardless of their real or imagined source.<sup>25</sup> Tausk carried out his studies on mentally ill patients at a time when visual abstraction was first being introduced into visual culture. The mechanical television, for example, was an instrument that could make-visible abstracted data flowing through a copper cable and a rotating disk; a relatively difficult concept to understand without the necessary *symbolic* understanding of early transmission technologies. Those incapable of parsing the “tangible real” from the “symbolic real”, in this case, those suffering from schizophrenia, could potentially be understood as experiencing a sincere *problematic* of visual representation. What happens when one is unable to understand both how the instrument functions *and* the symbolic representations that it produces?<sup>26</sup>

Tausk realized the difficulty schizophrenia patients had in translating instrumentality from the physical to the cultural and social realms. The notion that our contemporary reality is being concealed via a growing number black-box technologies highlights the possibilities of misunderstandings in even normalized and daily phenomenon (such as operating a cellular telephone and sending an e-mail), as digital technologies reveal little tangible or visual evidence of their inner

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<sup>25</sup> Victor Tausk, "On the Origin of the 'Influencing Machine' in schizophrenia," *The Psychoanalytic Quarterly* 2, no. 3-4 (1933): 519-520.

<sup>26</sup> Quantum computing is a reasonable example here. Symbolic and metaphorical attempts at explaining such instruments are incredibly difficult, as I can personally attest. For a non-expert in the field of quantum computing, such a technology is highly coded and difficult to understand.

workings for users to internalize. While Tausk's patients may have suffered from this disconnect more than most others within society due to mental illness, it is likely that many others experience at least some crisis of understanding with regards to the constant tide of evolving contemporary technologies. As such, the above examples are useful when shifting the conversation of instruments from the realm of the physical, to the cultural and philosophical.

In a series of lectures delivered in Bremen in 1949, Martin Heidegger introduced technology as not simply an instrument or tool used by man, but something whose essence (*Gestell*) functions dually to reveal truth through "Enframing," and subsequently acts as a form of mediation that hinders the possibility of encountering the world as it "is." This conceptual turn distances us from the pure physical understanding of technological objects, towards one of understanding technology as grounded within the social and the cultural. Heidegger warned that the essence of technology relegates humanity to an endless chain of ordering, while expanding on what he means by the term Enframing:

Enframing does not simply endanger man in his relationship to himself and to everything that is. As a destining, [Enframing] banishes man into that kind of revealing which is an ordering. Where this ordering holds sway, it drives out every other possibility of revealing. Above all, Enframing conceals that revealing which, in the sense of *poiēsis*, lets what presences come forth into appearance [...] Thus the challenging Enframing not only conceals a former way of revealing, bringing-forth, but it conceals revealing itself and with it That wherein unconcealment, i.e., truth, comes to pass.<sup>27</sup>

In the case of scientific instruments, we might understand "ordering" as the obsessive collection of the symbolic representations required by scientific advancement. The absence of "revealing," here, can refer to the way we cannot fully understand the inner workings of a plethora of techno-instruments by using them in

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<sup>27</sup> *Poiēsis* is a term that will be discussed in the following section, as Alexander Galloway uses the term as well. For now, it is sufficient to say that the Greek term originated as an expression for the activity in which a person brings something into being that did not exist before. Martin Heidegger, "The Question Concerning Technology," 27.



the act for which they were created.<sup>28</sup> For example, to understand increasingly complex phenomena, one must accept certain facts (embodied within an instrument), or be forced to rediscover them *ad infinitum*. Finally, “Enframing” can refer to the ways we have come to accept coded phenomena without question, as the scientist *must* do to advance knowledge production.<sup>29</sup>

The danger Heidegger envisioned, however, is that technology can reign and become the trap of the interface that we experience today. It produces an inability to see outside of its mediation (or its symbolic representations), as it becomes all too ingrained within a coded contemporary reality.<sup>30</sup> Many other examples of such a phenomenon exist today, such as the Internet as a virtual place that can feel as real as any physical space. These phenomena rely on a symbolic understanding of the world where the technical codes underlying their functioning are either forgotten or deemed unnecessary to know by the majority. This, of course, includes, for example, the use of scientific metaphors to understand quantum mechanics, and all of the learned theories one might use to interpret complex phenomena. However, Heidegger argued that it is the *recognition* of the danger of technology that allows us to glimpse and respond to what has been forgotten about our understanding of the world, prior to a technology’s introduction.

Recognition of danger tends to spur a desire for historical insight, as when a greater understanding of the roots of an event, such as the Internet becoming an addiction or stock markets teetering towards collapse, provokes an enlightened discourse. Humanity is only powerless against the veiling effect of technology if it fails to question, for technology can never be overcome through action, because, in Heidegger’s words, we are never its master. The conclusion of his lecture offers both

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<sup>28</sup> “Revealing” to Heidegger often refers to our tendency to consider every object as a potential raw material for technical action. Andrew Feenberg summarizes: “Objects enter our experience only in so far as we notice their usefulness in the technological system.” Andrew Feenberg, “Critical Theory of Technology: An Overview,” in *Tailoring Biotechnologies* 1, 2005, 48.

<sup>29</sup> As Latour suggests, the scientific paper becomes accepted as *true* if enough members of the community reference it. In this way, each discovery “Enframes” the next.

<sup>30</sup> Max Frisch offers in his novel *Homo Faber*: “Technology is the knack of so arranging the world that we don’t have to experience it.” See Max Frisch, *Homo Faber*, trans. Michael Bullock (London: Abelard-Shuman, 1959), 178.

a timely warning and a potential form of resistance that will form the basis of further discussion:

Whether art may be granted this highest possibility of its essence in the midst of the extreme danger, no one can tell. Yet we can be astounded. Before what? Before this other possibility: that the frenziedness of technology may entrench itself everywhere to such an extent that someday, throughout everything technological, the essence of technology may come to presence in the coming-to-pass of truth [...] Because the essence of technology is nothing technological, essential reflection upon technology and decisive confrontation with it must happen in a realm that is, on the one hand, akin to the essence of technology and, on the other, fundamentally different from it.<sup>31</sup>

It is important to note the timing of Heidegger's lecture, delivered only five years after Alan Turing developed Colossus to break Adolf Hitler's Enigma encryption machine—often considered the precursor to the modern computer—and only three years following the construction, testing, and use of atomic war technology. This moment in history contained the potential for a fearful escalation of entrenched technology; how it can conceal through codes and violence, rather than become a force of revelation. In a more contemporary context, we may consider the mass displacement of employment by artificial intelligence, identity theft via social networks, the dangers of unsolicited hacking of both personal and governmental networks, the danger of artificially controlled automobiles, and the growing roots of technological reliance in every crevice of daily life. As such, Herbert Marcuse regards technology as “a mode of organization and perpetuating (or changing) social relationships, a manifestation of prevalent thought and behaviour patterns, and [an] instrument for control and domination,” which can escalate such concerns to frightful levels.<sup>32</sup> Considering technology can be used by those with greater means, to wield it proficiently and at a significant scale, it is reasonable to continuously reflect on the instruments which can significantly alter power dynamics.

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<sup>31</sup> Martin Heidegger, “The Question Concerning Technology,” 35.

<sup>32</sup> Marcuse, Herbert, and Douglas Kellner. *Technology, War and Fascism: Collected Papers of Herbert Marcuse*. London: Routledge, 1998.

In his conclusion, Heidegger proclaimed that the only force possessing the ability to counter the extreme danger of the “coming presence of technology that threatens revealing” once shared a similar name, *technē*, or the power possessed by the fine arts as imagined in ancient Greece.<sup>33</sup> However, prior to an analysis of how art and the production of cultural artifacts can be a fruitful source of revelation, which follows in the second chapter, it is useful to briefly explore the current state of technology in culture via the particularly timely theory of interfaces, as it will be a useful tool of analysis in the following chapter.

## 1.4 CONTEMPORARY TECHNOLOGY AND INTERFACES

In *24/7: Late Capitalism and the End of Sleep*, Jonathan Crary presents us with a contemporary globalized culture brimming with technological artifacts and influences. Throughout this text, arguments about contemporary technology’s grasp on our perceptions of space and time, as well as our relentless desire for the technocommodities of capitalistic enterprise, form a thesis that can seem overwhelming: Crary argues that the newness of technological advances creates tools that do not have time to slip into the periphery of one’s life, require our full attention to operate, and introduce a constant “now-ness” without reflection.<sup>34</sup> Rather than provide the means, technology becomes the end in itself; it is the instrument that demands its own ever-efficient use, never reaching a state of user *or* producer contentment.<sup>35</sup> This insight forces us to reflect on Heidegger’s call for further reflection on technology; for it is the constant requirement to mediate through technology that we can seemingly never fully grasp that hinders our ability to think beyond its simulations. While Crary’s argument focuses more directly on corporate and political social structures, it also reverberates throughout many other contemporary

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<sup>33</sup> Martin Heidegger, “The Question Concerning Technology,” 35.

<sup>34</sup> Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (New York: Verso, 2013), 45.

<sup>35</sup> *Ibid.*, 45-6.

practices, including those of the scientific laboratory (not without its own corporate and political stimuli).<sup>36</sup>

Paul Virilio observes similar conditions in the cultures of science and the cyberspace of networks. With a focus on the growing abundance of information via technology, Virilio points to similar enslavement via optical and technical devices. He describes how technology as a mediator cannot exist without the potential for accidents, further complicating our imbroglio with it. For example, Virilio argues that the invention of the locomotive also contained within it the invention of derailment, and perceives the accident as a negative outgrowth of social positivism and scientific progress.<sup>37</sup> By Virilio's account, the growth of technology, namely television (but easily the Internet and more complex phenomena as well), separates us directly from the events of real space and real time, pointing to a loss of wisdom and sight of our immediate horizon, as we "resort to the indirect horizon of our dissimulated environment."<sup>38</sup> Indeed, "one of the earliest signs of technology complicating human life was the advent of the railroad, which necessitated the development of standardized time zones in the United States, to coordinate the dozens of new trains that were crisscrossing the continent."<sup>39</sup> Samuel Arbesman, in an essay considering the indecipherability of contemporary technology, continues: "The nightmare scenario is not Skynet—a self-aware network declaring war on humanity—but messy systems so convoluted that nearly any glitch...can happen."<sup>40</sup>

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<sup>36</sup> I experienced these stimuli throughout many conversations during my own site visits. Directors and Public Relations officers from CERN and The Pierre Auger Observatory (amongst many others) cite the political nature of gaining the support of public funding during moments of increased competition and funding cuts. Bruno Latour also explores these macro issues in depth. See: Latour, "Give me a laboratory and I will raise the world," in *Science Observed*, 141 (1983): 170.

<sup>37</sup> Virilio offers at least two articulations of this idea: 1) "When you invent the ship, you also invent the shipwreck; when you invent the plane you also invent the plane crash; and when you invent electricity, you invent electrocution.... Every technology carries its own negativity, which is invented at the same time as technical progress" (Paul Virilio, *Politics of the Very Worst* (New York: Semiotext(e), 1999), 89); and 2) "To invent the sailing ship or the steamer is to invent the shipwreck. To invent the train is to invent the rail accident of derailment. To invent the family automobile is to produce the pile-up on the highway" (Paul Virilio, *The Original Accident* (Cambridge: Polity, 2007), 10).

<sup>38</sup> Paul Virilio, *The Original Accident*, 38-40.

<sup>39</sup> Samuel Arbesman, "Is Technology Making the World Indecipherable?" *Aeon*, January 6, 2014, accessed March 24, 2018, <https://aeon.co/essays/is-technology-making-the-world-indecipherable>.

<sup>40</sup> Ibid.

It is indeed worthwhile to reflect on the potential to produce new accidents, with new technologies, in a moment when even our current techno-instruments are not adequately digested in their present form. Recent outsider insights into the practice of science have also identified the relatively new problem of what could best be considered the “information overload” of contemporary scientific practice. For example, Marc Edwards and Siddhartha Roy recently contributed a paper that argues that an “increased reliance on emerging quantitative performance metrics that value numbers of papers, citations and research dollars raised has decreased the emphasis on socially relevant outcomes and quality.”<sup>41</sup> They also identify concerns that such pressures can encourage unethical conduct by scientists within institutions in such a hypercompetitive environment.<sup>42</sup> They suspect that the existing perverse-incentive environment pushes researchers to overemphasize quantity to compete, leaving true scientific productivity at less than optimal levels.<sup>43</sup>

It has also been argued that science is experiencing a significant data crisis. In an essay regarding the limited capacity of the human mind to comprehend overwhelming sets of data, biomedical scientist Ahmed Alkhateeb points to the fact that there are “1.2 million new papers published in the biomedical sciences alone, bringing the total number of peer-reviewed biomedical papers to over 26 million.”<sup>44</sup> These numbers, combined with the facts that the average scientist reads only 264 scientific papers per year *and* that the majority of publications within scientific papers are deemed irreproducible, raises questions regarding the utility of a quantitative approach to knowledge production.<sup>45</sup>

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<sup>41</sup> Marc A. Edwards, *et al.*, “Academic Research in the 21st century: Maintaining Scientific Integrity in a Climate of Perverse Incentives and Hypercompetition,” in *Environmental Engineering Science* 34, no. 1 (2017): 51.

<sup>42</sup> *Ibid.*, 51.

<sup>43</sup> *Ibid.*, 51-61.

<sup>44</sup> Ahmed Alkhateeb, “Science Has Outgrown the Human Mind and Its Limited Capacities,” in *Aeon*, April 24, 2017, accessed on March 24, 2018, <http://www.aeon.com/ideas/science-has-outgrown-the-human-mind-and-its-limited-capacities>.

<sup>45</sup> Richard Van Noorden, “Scientists May Be Reaching a Peak in Reading Habits,” *Nature News*, Nature Publishing Group, February 3, 2014, accessed March 24, 2018, <http://www.nature.com/news/scientists-may-be-reaching-a-peak-in-reading-habits-1.14658>; Glenn C. Begley and Ellis M. Lee, “Drug Development: Raise Standards for Preclinical Cancer Research,” *Nature* 483, no. 7391 (2012): 531-533.

As if overwhelmingly large data sets and a reduced propensity for “quality” science geared towards socially relevant issues is not enough of a concern, Lev Manovich examines a more visible phenomenon that can distort and obscure scientific output. In *Inside Photoshop*, Manovich investigates the popular photo editing software by Adobe [Plate 1]. He urges the viewer of images to consider how the “analogue” photographic effects historically used by photographers are simulated via software, and how software introduces an all-together new set of image editing techniques previously impossible to analogue photographers. Many of the functions introduced to image editors via the software have no grounding in analogue methods, and are thus new tools of visualization with no grounding in traditional methods of representation. In this way, the production of images can mirror the cyclical nature of technological production. Software can, within its design: imply, hide, and selectively reveal what is possible via its design, through social choices made by software engineers, designers, and marketing professionals, with regards to additions of new features, refinements and updates. Nearly all contemporary inscription machines inherently and necessarily participate in some form of software mediation based on alterable and manipulatable software commands, as most large scientific endeavours rely on a host of digital technology to store, interpret, tweak, modify, and ultimately store their data.

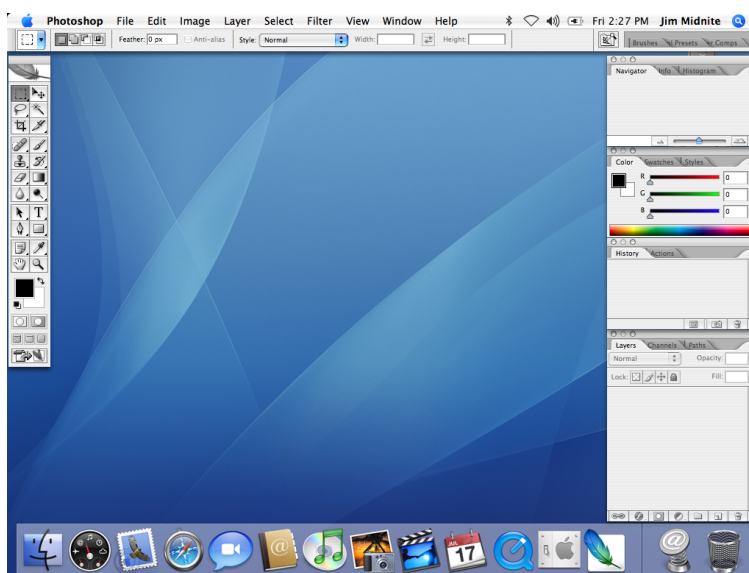


Plate 1 - Lev Manovich, *Inside Photoshop*, 2011.  
<http://computationalculture.net/article/inside-photoshop>.

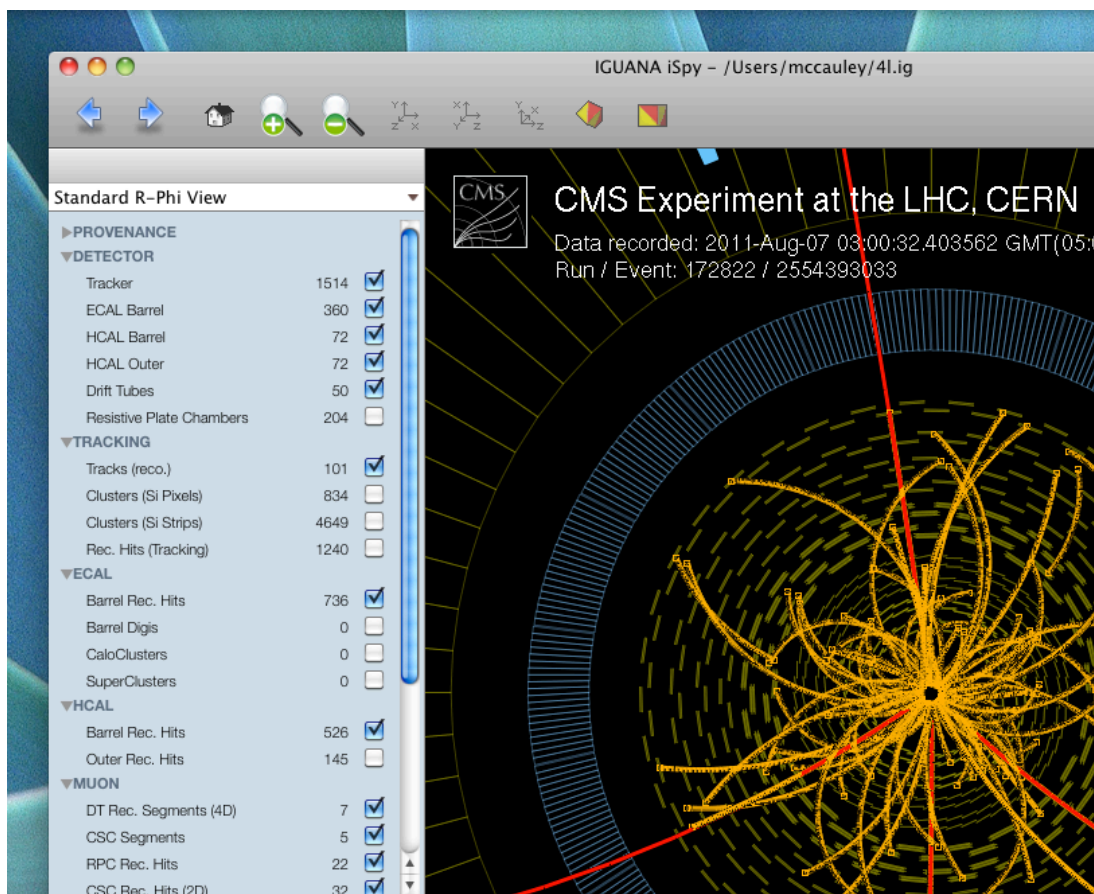


Plate 2 – CERN, *CMS Event Display*, Accessed May 7, 2015.  
<http://ispy.web.cern.ch/ispy/1.5.0/images/clip.png>

Adobe Photoshop is primarily designed for the editing of what we would consider traditional camera images, though the tools and instruments used within science also rely on mediating software to interpret data into a visual form for scientific understanding. In a functional and easily accessible example, CERN recently released software [Plate 2] to anyone with an Internet connection and a curiosity—scientist and non-scientist alike—that provides access to the analysis data of experiments hosted on their remote servers. This data is offered through a visualization filter and analysis software, the same used by researchers at CERN. One might now imagine what this “CMS Event Display” software implies, hides, and reveals about what is physically happening during experiments (which, in their entirety, is likely outside of the realm of non-symbolic representation).<sup>46</sup> Questions

<sup>46</sup> Sandra Mitchell, “Why Integrated Pluralism?” *E:CO*, 6, no. 1-2 (2004), 81.

concerning the accuracy of the coding, the efficiency of the software, and the choices made by the software engineers all point to design choices and limitations that alter the experiment and our perceptions of it. Even the physical construction of the inscription devices includes hard-wired coding, offering the potential for errors and interpretation at one point or another.<sup>47</sup> The most instructive and straightforward observation, however, is that the visualization elements introduced by the software undoubtedly influence how researchers and the public envision what is happening inside this giant black-box: curvy orange-coloured particles emerge as a measure of the reality existing within the experiment, as this is the colour that was chosen to represent them as such.

While the link of shape and colour to particles—symbolic to the “real”—might be considered trivial to our understanding of what happens inside a techno-science machine, it would be a mistake not to consider the enormous capacity of visualization software and the power of images to alter perceptions of reality. Scientific instruments primarily record data, which in turn influences the manufacture of future technologies, which in turn influences more scientific experiments. Cultural images also influence the course of scientific imagery in much the same way. *Images* of distant galaxies inspire dreams of future colonization, and *not* the other way around, so analyzing the images produced by scientific instruments is, in essence, a cultural necessity. Without inscriptions and interpretations, we could hardly imagine what exists outside of our immediate understanding, so the determination of what role these mediations play in our perception of science and new forms of knowledge remain critical.

As an example of why the critical analysis of inscriptions remains culturally vital we may look to a phenomenon within scientific production occurring in the competitive scientific environment. An increasing number of scientists are attempting to construct facts through the selective analysis of data that relies on unverifiable symbols (i.e. manipulative graphs, incomplete charts, fabricated

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<sup>47</sup> As a humorous example, during a site visit to ATNF Parkes Radio Telescope, a scientist relayed a story to me of how a microwave oven on the grounds of the research centre was mistaken for distant radio signals, and had baffled scientists for 17 years.



findings), and that do *not* reflect the realities of the experiment that had been conducted.<sup>48</sup> A striking example of this is Andrew Wakefield's study that claimed to identify a relationship between vaccines and autism, which was retracted by the British Journal of Medicine in 2010, on the grounds that the data contained within was fixed. One can only assume that attempts to contribute to scientific understanding that are *not* grounded in rigorous analysis—in the hopes that even the experts in a given field of study will not decode the “inner-workings” of an experiment—relies on the growth of complex symbols that the majority cannot be expected to understand. To publish a scientific paper that is inherently deceptive, or so complex that others choose to accept it without understanding it, would only be possible in a moment of representational crisis. And if such production inspires a temptation amongst scientists to fake and alter data in the hopes of achieving “demigod” status, while knowing that false data could not possibly withstand the micro-social phenomenon inherent within the construction of facts through the laboratory that Latour refers to, it is necessary to ask how mediation through symbolic representation affects the cultural perception of other less rigorously controlled environments.<sup>49</sup>

As contemporary science relies almost entirely on inscription devices to interpret phenomena and advance knowledge, visual culture relies on inscriptions to construct the social reality it inhabits. Alexander Galloway's theory of Interfaces helps to dissect the impact of such an entanglement. *All* hybrid contemporary media have highly coded and symbolic messages. Galloway, like Heidegger, stresses the importance of understanding that Interfaces not be confused with the screen or device itself (Heidegger would say tool or instrument), but rather are political frameworks that encompass all potential modes of mediation through use (or Enframing). The challenge then lies in decoding the Interface and locating the meanings hidden within the inscriptions produced throughout all forms of visual culture. In this regard, Galloway offers four regimes of signification that categorize

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<sup>48</sup> Jill Neimark, “The Retraction War,” *Aeon.co*, December 23, 2014, accessed March 24, 2018, <https://aeon.co/essays/are-the-retraction-wars-a-sign-that-science-is-broken>.

<sup>49</sup> *Ibid.*; Latour, *Laboratory Life*, 236.

the aesthetics and politics of the in/coherence of interfaces: *ideological*, *ethical*, *poetic*, and *truth*.<sup>50</sup> Galloway stresses that his theory does not imply a hierarchy, but rather is useful for helping us to locate political and ideological voices inherent in contemporary modes of visual production, which in turn tend to create our understanding of the cultural world. For example, he describes the Western cultural shift from an *ideological* to an *ethical* regime, in part due to an adoption of various normative techniques “wherein given aesthetic dominants are shattered via [a] foregrounding of the apparatus, alienation effects, and so on, in the service of a specific desired ethos.”<sup>51</sup> In this he refers to a visibility that has begun to question the apparatus, rather than bestow unquestioning objectivity to its representational capacity. Specifically, Galloway refers to software, new media, and our now networked social landscape, and the effect by which both the production of and access to information has remained politically coherent, but gradually shifted towards aesthetic illegibility.<sup>52</sup>

Galloway categorizes the texts produced by Heidegger in the regime of the poetic, referring to his philosophical delivery as politically incoherent/aesthetically coherent, due to the way in which the art of his philosophy is elevated over other concerns in his thinking.<sup>53</sup> When a text or visual symbol is aesthetically coherent, yet politically incoherent, it can be compared to “open source” software. A coherent form can easily be co-opted by any political ideology due to its powerful symbolic nature that claims independence from political discourse.<sup>54</sup> For example, the philosophy of Deleuze and Guattari has been co-opted by the Israeli Defense Forces, due to the text’s political “interpretability.”<sup>55</sup> Galloway thus raises the question: if we are to entertain Heidegger’s thoughts about culture’s ability to break through the

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<sup>50</sup> Alexander Galloway, *The Interface Effect* (Cambridge: Polity, 2012), 45-53.

<sup>51</sup> *Ibid.*, 42.

<sup>52</sup> This is covered more extensively in section 2.3.

<sup>53</sup> *Ibid.*, 50.

<sup>54</sup> *Ibid.*, 49-50.

<sup>55</sup> Galloway does not claim that the philosophies of Heidegger, Gilles Deleuze and Félix Guattari, as examples, are not political. Instead, he uses the term “unaligned” to describe the ways in which they can often be used by opposing political regimes when interpreted in differing ways. In this way, we might consider the ramifications of contemporary and future technologies that are also often represented as politically neutral.

blurring politics surrounding technology, then should we equally consider the political entities contiguous to technology and their stake in co-opting culture? Nevertheless, Galloway's regimes of signification provide a useful framework for evaluating the mediating effects of the many instruments of representation, including those that we have grown to trust within the institution of science.

To return to Heidegger, his lecture concludes in part with a quote from the poet Hölderlin: "But where the danger is, grows / The saving power also."<sup>56</sup> The poetic structure of his prose reflects the challenges that we often face in the evaluation of the costs/benefits of new techno-centric hyper-objects. Technology and its artifacts bear a salvation/damnation dichotomy in culture due to the many aesthetic representations and political forces they are obliged to bear. Thus, it is unclear just what contemporary tools and methods are capable of offering some form of Galloway's "truth," given their brief histories. However, Interfaces and their regimes of signification provide a useful framework for analyzing the production of scientific and cultural artifacts, both for identifying the mediation inherent within representations of technology and in recognizing the political influences hidden within all instruments of visual representation.

## 1.5 PHILOSOPHIES OF SCIENCE

"According to these tempting [social constructionist] views, no insider's perspective is privileged, because all drawings of inside-outside boundaries in knowledge are theorized as power moves, not moves towards truth."

— Donna Haraway<sup>57</sup>

The previous sections have revealed the underlying complexities latent in the tools and instruments we use to produce knowledge. We have explored how the

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<sup>56</sup> Heidegger, "The Question Concerning Technology," 27.

<sup>57</sup> Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," in *The Gender and Science Reader*, ed. Muriel Lederman (London: Routledge, 2001), 170.

machines of technology produce knowledge and the scale that such production takes. Latour provided insight into the functioning of instruments in a laboratory, and the translations and mediations that real-world phenomena undergo in the production of facts. We also explored the very tangible relationship between the recording instruments used in laboratories and more casual uses of the camera as a cultural tool. The concepts of the black-box and simulations further complicated our ability to fully understand how technologies function via the loss of a tacit relationship with many technologies, while Heidegger and other contemporary cultural theorists revealed the inherent masking effects of devices of recording and translation. The production of images is entangled with the production of knowledge, and our reliance on human influences in their construction raised questions regarding the truth claims that might be possible when employing using such tools. Finally, Galloway's theory of interfaces provided us with a theoretical framework that may help to uncover the political and aesthetic motives behind the images of technology, including those produced in the laboratory and throughout cultural production. The final section in this chapter collects some vital thoughts on the philosophy of science as it expands our vocabulary around instruments to include notions of uncertainty and interpretability.

As introduced briefly in the previous section, the notion of the mis-construction of facts via the institution of science has been under increasing scrutiny for the past several decades. The idea that scientific inquiry alone is capable of producing an accurate and whole representation of the world, even excluding its increasingly obfuscating tools of discovery, has rightfully been debated by philosophers of science who have argued several convincing alternatives. Considerations of the contexts of discovery, the privileged and secluded histories of the institution of science, gender and race relations, along with a more post-modern questioning of the likelihood of a single truth, have led many to search for a paradigm that more accurately represents the capacities and limitations of scientific inquiry. Many key practices of science, such as checks and balances, adequate sample sizes, and repeatability, remain relatively safe from external critique. However, the practice of science involves more than the mechanical motions and

seemingly objective events that occur in laboratories, leaving every experiment subject to a vast array of potential influences.

Historically, science has been practiced and dominated by a minority of privileged contributors. Donna Haraway proposes that feminist perspectives are vital in the analysis of scientific structures via the notion of “situated knowledges,” or rather, an acceptance that all forms of knowledge offer only a partial and biased perspective. Not unlike Heidegger, she likens the effect of the tools and instruments of science to visualizing tricks and powers that disembody viewers through technology, so much so, that objectivity becomes impossible. According to Haraway:

There is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines; there are only highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds. All these pictures of the world should not be allegories of infinite mobility and interchangeability but of elaborate specificity and difference and the loving care people might take to learn how to see faithfully from another’s point of view, even when the other is our own machine.<sup>58</sup>

While aspects of this declaration may seem conspicuously evident in the contemporary context, it is still easy to be seduced by the notion that knowledge is advancing toward some form of unification, where partial perspectives will fuse into a single *whole* truth.<sup>59</sup> Such a notion is the remnant of an ideal set forth by an institution that promised such a thing, though we must now accept that all knowledge is shrouded by mediations that shape its reception. Escaping such epistemological traps requires “politics and epistemologies of location, positioning, and situating,” where rational knowledge is a process of critical interpretation

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<sup>58</sup> Ibid., 175.

<sup>59</sup> This approach to knowledge is discussed in detail by Sandra Mitchell in defence of an integrated pluralist approach to knowledge formation. “If different models are perceived as partial solutions to a question, then one might argue that a theory of division of labor in social insects, for example, would be one that correctly unified the partial accounts. However, while integration of the partial accounts is indeed required for explaining a concrete particular unification at the theoretical level is unlikely to be very robust. This is due to the nature of the complexity characterizing the domain of phenomena studied. It is the diversity of the ‘solutions’ to adaptive problems and the historical contingencies influencing those variable paths that preclude global, theoretical unifications.” Sandra D. Mitchell, *Why Integrated Pluralism?*, 81.

among fields of interpreters and decoders, and as per Haraway, should remain a power sensitive conversation.<sup>60</sup>

Standpoint theory further suggests that the notion of objectivity must be post-modernized so that it becomes more useful within contemporary attempts to understand nature and social relations. Standpoint theory originated as a postmodern theory for analyzing intersubjective discourses and identifying points-of-view in seemingly objective situations. Rather than attempting to displace the ideal of objectivity, standpoint theorists Sandra Harding and Alison Wylie commit to clarifying what dis/advantages occur within social and cultural hierarchies of knowledge production, and how they continue to influence scientific output.<sup>61</sup> For example, the knowledge advanced by an authority figure can be steeped in cultural, racial, and gender biases, all of which offer potential advantages and/or disadvantages via their partial perspective on understanding the world.<sup>62</sup> Wylie argues that standpoint theory matters within any institution wielding power where there is a public at stake, because it calls for ongoing self-reflection within the process of knowledge production where “none are immune from possible revision when a misfit between belief and observation arises.”<sup>63</sup>

One of the greatest discords between the public reception of science and its actual practice is that science produces only facts, and is not directly linked to its technological products. However, the view that scientific output is a commodity not unlike the technology that underscores its functioning is directly linked to capitalist culture and notions of a labour economy and can be traced to the theories of Karl Marx. While science is an inherently social venture for Marx, he would regardless state that “modern industry makes science a productive force distinct from labour

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<sup>60</sup> Donna Haraway, *Situated Knowledges*, 179.

<sup>61</sup> Sandra Harding, “‘Strong Objectivity’: A Response to the New Objectivity Question,” *Synthese* 104, no. 3 (1995): 331-349; Allison Wylie, “Why Standpoint Matters,” *Science and Other Cultures: Issues in Philosophies of Science and Technology*, ed. Sandra Harding (London: Routledge, 2003), 26-48.

<sup>62</sup> Wylie presents us with the fictional account of a black slave housekeeper named Blanche, who, given her political position within a secretive household, is privy to many private conversations under the assumption that she does not have the capacity to comprehend them. Such a position, given that she indeed does have the capacity to understand, allows Blanche to formulate a viewpoint of her host family that is likely more complete than those of other members living in the home.

<sup>63</sup> Sandra Harding, *Strong Objectivity*, 345.

and presses it into the *service* of capital.”<sup>64</sup> Heather Douglas further obliges these sentiments in her questioning of the roots of value within science, in the hopes of dispelling the myths that science can function as a “value-free” institution. According to Douglas, it is via the cultural stranglehold of objectivity as value-free that notions of value have become blurred within the practice and dissemination of scientific endeavour. In other words, objectivity and value—much to their detriment—are often considered morally contradictory.<sup>65</sup>

Douglas argues that rejecting the ideal of value-free science does not diminish science’s objectivity and that we have plenty of remaining resources with which to understand and evaluate the objectivity of science. She proposes a value-laden approach that might allow for a better understanding of the nature of scientific controversy, and in many cases, “even help speed resolution of those controversies.”<sup>66</sup> Such an approach calls for greater ethical and social reflection among scientists, and Douglas implores that we “hold scientists to the same responsibilities that the rest of us have [and that] the judgments needed to do science cannot escape the consideration of potential consequences, both intended and unintended, both epistemically relevant and socially relevant.”<sup>67</sup> While Douglas implies that such considerations should be the responsibility of the scientist, useful reflection can and should be practiced throughout cultural production as well. This is one area where greater participation between cultural and scientific producers would be most fruitful, as the analysis of the ramifications of science—creatively, morally, and logically—will continue to be of import as science continues to produce artifacts that directly affect our relationship to the world. As Douglas iterated in her well-formed conclusion, certain kinds of diversity may significantly enrich scientific inquiry.

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<sup>64</sup> Karl Marx, “Capital Vol. 1, Chapter Fourteen: Division of Labour and Manufacture,” *Marxist.org*, accessed March 24, 2018, <https://www.marxists.org/archive/marx/works/1867-c1/ch14.htm> (emphasis added).

<sup>65</sup> Heather Douglas, “Rejecting the Ideals of Value Free Science,” 123.

<sup>66</sup> *Ibid.* 121-2.

<sup>67</sup> *Ibid.* 126.

This discussion stems from the notion that science does not just produce facts, but ultimately things, and these things should be foregrounded rather than hidden. As John Dupré argues, the separation that occurs between scientific investigation and its end products in effect masks the value/function relationship we need to understand in order to evaluate the science that matters to us.<sup>68</sup> In other words, without value judgements, there is far too much ground to cover and far too many potential pitfalls and wasted efforts on our route to knowledge. As a partial solution towards evaluating the value of scientific inquiry, Helen Longino clarifies that two forms of value must be present within science, the first being constitutive and the second contextual, both of which should be given equal consideration. Constitutive values are those that determine what constitutes acceptable scientific practice or scientific method, while contextual value refers to personal, social, and cultural perceptions of what “ought to be.”<sup>69</sup> This way, the social and cultural idea that value and objectivity are inherently conflicted can be re-evaluated as potentially responsible for lack of autocritique within knowledge production at a time when more is undoubtedly necessary.

Longino cites many examples, such as the pharmaceutical industry’s preference to a search for cures rather than preventions, a preference in which internal and external factors are clearly at play, when selecting the goals of inquiry. Barry Barns and David Bloor, in their strong program in the sociology of science, hold that social interests are indeed profoundly involved within scientific practice, and thus ultimately question the so-called autonomy and epistemological integrity of science.<sup>70</sup> They argue that (1) there is no transcendent or context independent criterion of rational justification that renders some beliefs (hypothesis) more credible than others; and (2) that explanations for why a given set of beliefs is found in a given context depends on features of the context and not on intrinsic properties

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<sup>68</sup> Dupré, John, *Fact and Value* (Oxford: Oxford University Press, 2007), 27.

<sup>69</sup> Helen Longino, “Beyond ‘Bad Science’: Skeptical Reflections on the Value-Freedom of Scientific Inquiry,” *Science, Technology & Human Values*, 8, no. 1 (1983), 12-15.

<sup>70</sup> Barry Barns, “Relativism, Rationalism and the Sociology of Knowledge,” *Rationality and Relativism*, ed. M. Hollis (England: Basil Blackwell, 1982), 21-47.



of the beliefs.<sup>71</sup> According to Longino, all outcomes in science are negotiated. However, if belief is context dependent and no intrinsic properties are informing rational justification, then a more open-ended approach must be considered in our engagement with knowledge production.

Integrated pluralism offers one such approach, which, as Sandra Mitchell argues, is grounded in “the suggestion that our current best theories of the nature of nature exactly capture the world in all its details is hubris.”<sup>72</sup> She prefaces her argument by noting that the idealized and partial character of our representations, and the inherently social and political nature of knowledge production, suggest that there will never be a single account that can solely describe and explain complex phenomena. As such, a plausible model of pluralism—the idea that knowledge is produced via an array of social actors and partial perspectives of differing expertise—can be forged from understanding that causal models are abstractions that will always remain idealizations, because they are not universal but context dependent. For example, a theoretical model of climate change functions at a merely theoretical level and can never deal with the complexity of an entire system of unpredictable moving parts. In fact, Mitchell grounds her argument within the philosophy that complexity is a critical tool for understanding the nature and limits of diversity in representations. She thus implies that in order to accurately describe the world around us, many forms of knowledge must be integrated in the hopes of providing any clear description regarding what we aim to represent:

Scientific representations are abstractions or idealizations. They can represent only partial features of individuals rather than the individuals themselves as complex casual agents. An individual human being is truly described in different theories at the same time as a host to a parasite, a consumer in an ecosystem, and a phenotypic expression of a set of genotypes, as well as a mammalian organism, a homeostatic endotherm, and organization of multiple cell types, and so on.<sup>73</sup>

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<sup>71</sup> Ibid., 21-47.

<sup>72</sup> Sandra D. Mitchell, “Why Integrated Pluralism?,” 81.

<sup>73</sup> Ibid., 83.

The list Mitchell initiates begins with various forms of representations and is necessarily limited, yet we can easily imagine it branching infinitely. Presumably, as a philosopher of science, her notions do not necessarily consider forms of knowledge production outside of science, but there is no reason they should not. Rudolf Carnap, a major contributor to a stream of philosophy called logical positivism (chiefly concerned with how experience justifies empirical knowledge), offers the following: "Let us learn from the lessons of history. Let us grant those who work in any special field of investigation the freedom to use any form of expression which seems useful to them."<sup>74</sup> Such an approach stems from the idea that forms of expression deemed inadequate or unsuccessful will eventually be eliminated; however, they should not be rejected *a priori*.

Paul Feyerband directs us to the final notion that we will explore from the philosophy of science, one that poignantly relishes in the irrationality of scientific progress and the dangers of ignoring other forms of knowledge production. In his notes on knowledge, science, and relativism, Feyerband argues that (1) scientific investigation lacks the uniformity that is needed to give us a coherent point-of-view; (2) science has frequently employed procedures which are now regarded as 'irrational', so to use it as a standard of rationality we would already have to know how to separate the good from the bad; (3) science is not the only institution that has results, reaches its aims, and has a certain amount of coherence; and (4) facts, traditions and institutions may be rational in conforming to their own standards, but cannot give us the values and standards we should strive for.<sup>75</sup> A standard argument of rationalists is that relativism (or pluralism) opens the door to chaos and arbitrariness; however, this opinion is elegantly combatted by the notion that every major scientific revolution has been informed by facts, concepts, and notions that go against all prior accepted forms of knowledge.<sup>76</sup> In the special cases of science, when it happens to answer a question we did not even know to ask (how some of the most

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<sup>74</sup> Rudolph Carnap, *Meaning and Necessity* (Chicago: University of Chicago Press, 1950), 221.

<sup>75</sup> Paul K. Feyerband, *Knowledge, Science and Relativism* (Cambridge, UK: Cambridge University Press, 1999), 205-6.

<sup>76</sup> Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

significant paradigm shifts in knowledge have occurred), it seems that “irrational” and “unconventional” methods of knowledge production are indispensable. This thought is worth reflecting on at a time when scientific output seems to have outpaced our ability to understand its ramifications. Perhaps the next revolution that science must strive for is one that pierces the perceived outer shell of rationality, revealing an inner core that is aware of the corollary nature of knowledge.

While one can hope for such a scientific revolution, it is more likely to require variety in method and discipline. As Mark Edwards and Siddhartha Roy conclude regarding the perverse climate of competition within science and scientific research, we risk a contemporary “dark age” should funding agencies not reprioritize intellectual inquiry as a public good, rather than a metrics and results-based endeavour. They stress that once public opinion turns against science due to the increasing pressures of results-based science, regaining its status as an enlightened and trustworthy discourse will be problematic.

## 1.6 CONCLUSION

Anthropogenic climate change could not exist prior to the discovery of fossil fuels, and mass destruction would be impossible without the proliferation of nuclear technologies. The ability to render ourselves extinct gives humans the power once reserved to gods and mythical beings. It is thus necessary to emphasize forms of knowledge that combat the ever-growing cultural tendency toward “make first” and “ask questions later,” as the importance of questioning is directly proportional to the potential ramifications of powerful technological objects. The difficulty lies in identifying the potential of our actions in the present, and this endeavour cannot rely singly on any discipline. It must preferably be continuously engaged in via those disciplines that are best at asking questions and rely little on provable and functional results in order to remain valid within the practice of inquiry. As Heidegger suggests, enlightenment with regards to technology, and a sincere

reflection upon it, might best be investigated with an approach that employs its instruments, though is somehow vastly different to it. As such, the cultural use of instruments, as employed by the visual arts, and particularly the camera and its resulting photographic inscriptions, may have much to contribute in this regard.

In a moment of rapid technological evolution, it is worthwhile considering the idea that our capacity to develop new instruments and technologies via science has outpaced our ability to contemplate their value via the humanities. Since the way in which technology and science is represented has a way of influencing how it continues to function in the future, it is sensible to expand our dialogue with it in as many ways as possible. We must make sure that our discourse with the visual symbols that shape our perceptions involves a shift away from seeing science, instruments, and technologies, as things that can unproblematically explain themselves. Rather, it must be emphasized that such objects and practices rely much more heavily on cultural factors and the proliferation of visual symbols. Doing so involves reigning in a Heideggerian nearness that is perhaps becoming more difficult via an exponentiation of interfaces. With more questions may not come more answers, but no answers can exist where questioning ends.

## 2.0 INTERFACES OF NEARNESS: PHOTOGRAPHIC STRATEGIES OF TECHNOLOGICAL REPRESENTATION

“In photography there is a reality so subtle that it becomes more real than reality.”

— Alfred Stieglitz

### 2.1 INTRODUCTION

The previous chapter served as an introduction to critical issues regarding the rapid growth of technical and scientific knowledge and objects over the last several centuries. In this chapter, I consider how documentary photography and artistic production can aid in understanding the objects and impacts of the varied forms of technology within our social landscape. What kind of understanding can the photographic camera, in the hands of an artist, bring to the ceaseless and cyclical proliferation of technology and its objects? This chapter explores the artistic and cultural practices, particularly within documentary photography, that best offer approaches for answering this query. Since the objects and effects of technology are so far-reaching and so entangled with our daily lives, no one method or subject in artistic and documentary production could adequately address such a broad and knotty topic. Instead, I propose to recognize and situate several ways image makers have addressed such concerns. The result is a more lucid way of understanding the functioning of specific modes of photographic representation that share striking similarities with the phenomena they attempt to record.

I propose that documentary photography, in its varying forms, plays an integral role in our understanding of cultures—in its ability to show what has happened in the past, in its uncanny ability to act as a mirror to our culture in the present, and finally, in the part it inevitably plays in shaping the future. As such, our relationship to it and our insights into how it functions—in the context of a growing reliance on technology that continues to digitize and hybridize our physical forms—

will be of significant consequence. The photographic camera is often incapable of directly capturing the invisible forces hidden within many of our contemporary techno-objects, but we must harness its hidden functions in ways we have seen and discover new ways of using it as a representational tool. In this chapter, I identify ways documentary has been successful in this regard, emphasizing the many diverse strategies that have been, and must continue to be, used for it to remain a fruitful tool of reflection and revelation.

While developed to decode the effect of the interface within our understanding of the content contained within it, Alexander Galloway consequently introduced a useful system to analyze documentary photographs in general. The terms coherent and incoherent, in their relationship to both the aesthetic and political, provide suitable categories for weighing the effects of specific modes of representation and their eventual reception, and a functional strategy for highlighting the utility of the artist's camera in representations of those aspects of technology that are difficult to visualize. As I mentioned in the previous chapter, Galloway refers to these modes as "regimes of signification," and categorizes the images (concepts and ideas) produced by interfaces into four distinct types: *ideological, ethical, poetic, and truth*.<sup>1</sup> Applying these regimes to photographic representations of technology offers a categorical framework for understanding the motivations and ramifications inherent in varied struggles to representing the elusive and the hidden.

Before proceeding, however, it is worthwhile to define Galloway's regimes more strictly within the context of documentary photography [see Fig. 1].<sup>2</sup> The *ideological regime* is characterized by both an aesthetic and a politics of coherence, what Galloway describes as "myth" and "propaganda" in this type of cultural production. A coherent aesthetic is one that simply "works," or might be best

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<sup>1</sup> Alexander Galloway, *The Interface Effect* (Cambridge: Polity, 2012), 45-47.

<sup>2</sup> Since they were developed to decode the varying interfaces of new media, some of the categorical terms that Galloway introduces could benefit from a different vocabulary, as they may seem counterintuitive when discussed within a photographic context. In these cases, I will suggest slightly different terms for clarity.

understood as the *studium* of an image.<sup>3</sup> A coherent politics likewise suggests the tendency of a work to organize around a central formation, or a “brand of politics [that] produces stable institutions, ones that involve centres of operation, known fields and capacities for regulating the flow of bodies and languages.”<sup>4</sup> Such a regime describes images that are visually understandable and digestible by the majority of viewers, projecting a relatively clear political motivation from its author(s). The *ethical regime* is characterized by a politics of coherence and an aesthetic of incoherence, where there is a “fixed” political aspiration that “comes into being through the application of various self-revealing or self-annihilating techniques within the aesthetic apparatus.”<sup>5</sup> An incoherent aesthetic, in contrast, is one that simply “doesn’t work,” though this should not be misconstrued as negative. Barthes’s term “punctum” might best describe an incoherent aesthetic, as would an image that explores or destroys its own limits of representation.<sup>6</sup> The *poetic regime* is characterized by an aesthetic of coherence and a politics of incoherence, and is what Galloway describes as “art for art’s sake.” Galloway offers the Greek term *poiēsis*, the process of meaning-making often found in the fine arts, as a way to interpret this mode. This regime introduces the concept of an incoherent politics, which “dissolves existing institutional bonds” and does not aspire to be “centered” or easily located within a political spectrum, but rather to introduce a “break with the present” by “renovating the very meaning of desire itself.”<sup>7</sup> Galloway’s final regime, *truth*, is necessarily tentative and a difficult category to delineate. Characterized by both an aesthetic and politics of incoherence, this regime is one that is often sidelined within culture, a “repressed of the repressed” as Galloway puts it.<sup>8</sup> What this term means within the context of cultural production and documentary photography will be explored in the following sections, but for now it might best be introduced as photography that challenges the aesthetic norms of the

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<sup>3</sup> Roland Barthes, *Camera Lucida: Reflections on Photography*, ed. Richard Howard (New York: Hill and Wang, 1981), 25-8.

<sup>4</sup> Alexander Galloway, *The Interface Effect*, 47.

<sup>5</sup> *Ibid.*, 48.

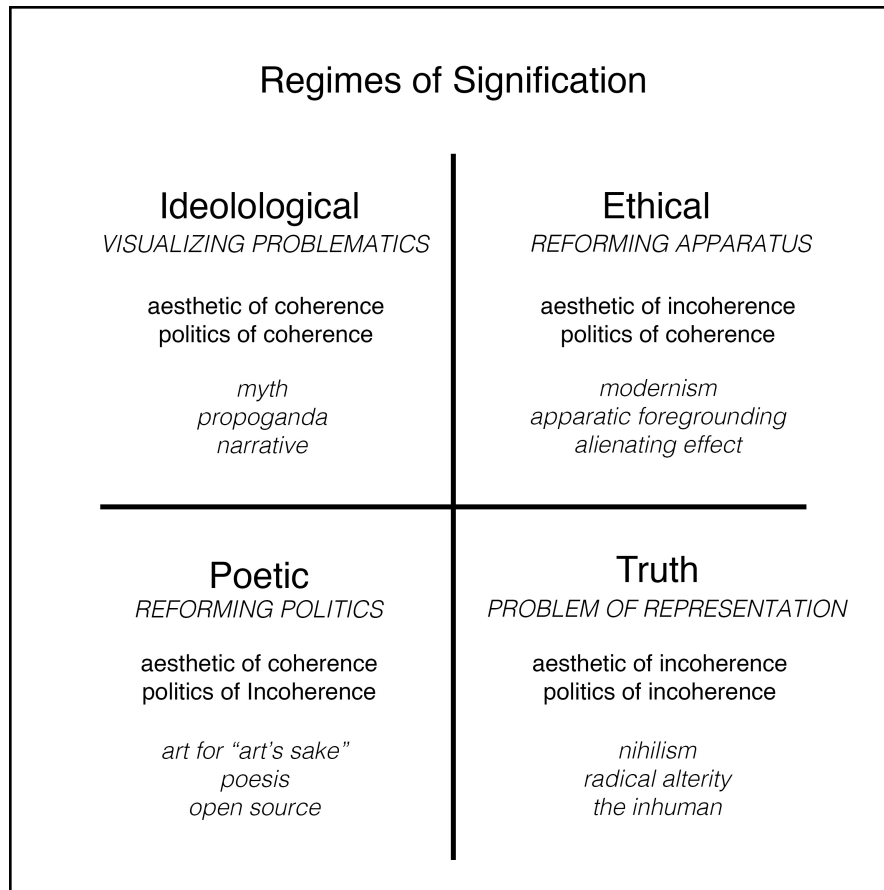
<sup>6</sup> Roland Barthes, *Camera Lucida: Reflections on Photography*, 43-47.

<sup>7</sup> *Ibid.*, 47.

<sup>8</sup> *Ibid.*, 50.

camera as an apparatus (and how it is *supposed* to be used), while also leaving the motivations behind its production and dissemination open to many possible interpretations.

**Figure 1 - Regimes of Signification**



## 2.2 IDEOLOGICAL DOCUMENTARY

Beginning in 1903, and for over forty years, Lewis Hine, a photographer well known in the history and popular culture of photography, had documented aspects of American society that he felt lacked adequate visualization within visual culture. With his box camera, Hine documented the life of steelworkers in Pittsburgh, the sweatshops and slums of New York City, and the construction of the Empire State



Building, amongst other transformations unravelling before him in a moment of radical technological change. Hine, however, is best known for his work with the National Child Labor Committee, for which he documented children forced to work twelve-hour shifts in textile mills, glasswork factories, and coal mines [Plate 3]. The American economy was expanding, and with it, a technological boom was underway that benefitted many via cheap labour. When these photographs were taken, more than two million children under sixteen years of age were an integral part of the American workforce.<sup>9</sup> Boys often worked in coal mines or picked slate from coal above ground, and girls tended to the deafening machines in the spinning rooms of cotton mills, often kept awake by having cold water thrown in their faces.<sup>10</sup> Managers of the factories Hine visited sometimes refused him entry or were hesitant to allow him to photograph in their spaces. One manager, quoted ironically by Hine, stated, he “consented to the making [of a] photograph on condition that things must be represented as they were”<sup>11</sup>—a statement that clearly indicates the level of blindness amongst factory owners at the time to the social injustice of child labour practices, and the clear ethical fracture between the general public, immigrant workers, and American factory owners.

Hine’s photographs of children tending to the machines of manufacture became over time instrumental in shifting public perceptions of child labour practices. Many in society were shielded from what was occurring by the factory doors. The effect of Hine’s photographs was not instantaneous, however. It took time for people to comprehend the damaging physical, psychological, and educational impact of extreme labour on children, even after seeing Hine’s images for themselves.<sup>12</sup> As such, shifting perceptions and laws, and policy reforms in general, required many years of dedicated effort by the National Child Labor Committee,

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<sup>9</sup> Russell Freedman, *Kids at Work: Lewis Hine and the Crusade against Child Labor* (Boston: Houghton Mifflin Harcourt, 1994), 1-2.

<sup>10</sup> Hugh Hindman, *Child Labor: An American History* (New York: M.E. Sharpe, 2002), 5.

<sup>11</sup> Peter Seixas, "Lewis Hine: From 'Social' to 'Interpretive' Photographer," *American Quarterly* 39, no. 3 (1987): 382.

<sup>12</sup> George M. Kober, "The Physical and Physiological Effects of Child Labor," *The ANNALS of the American Academy of Political and Social Science* 27, no. 2 (1906): 27-30.

though this process would have likely been much longer and more arduous had images like Hine's not entered the public realm.

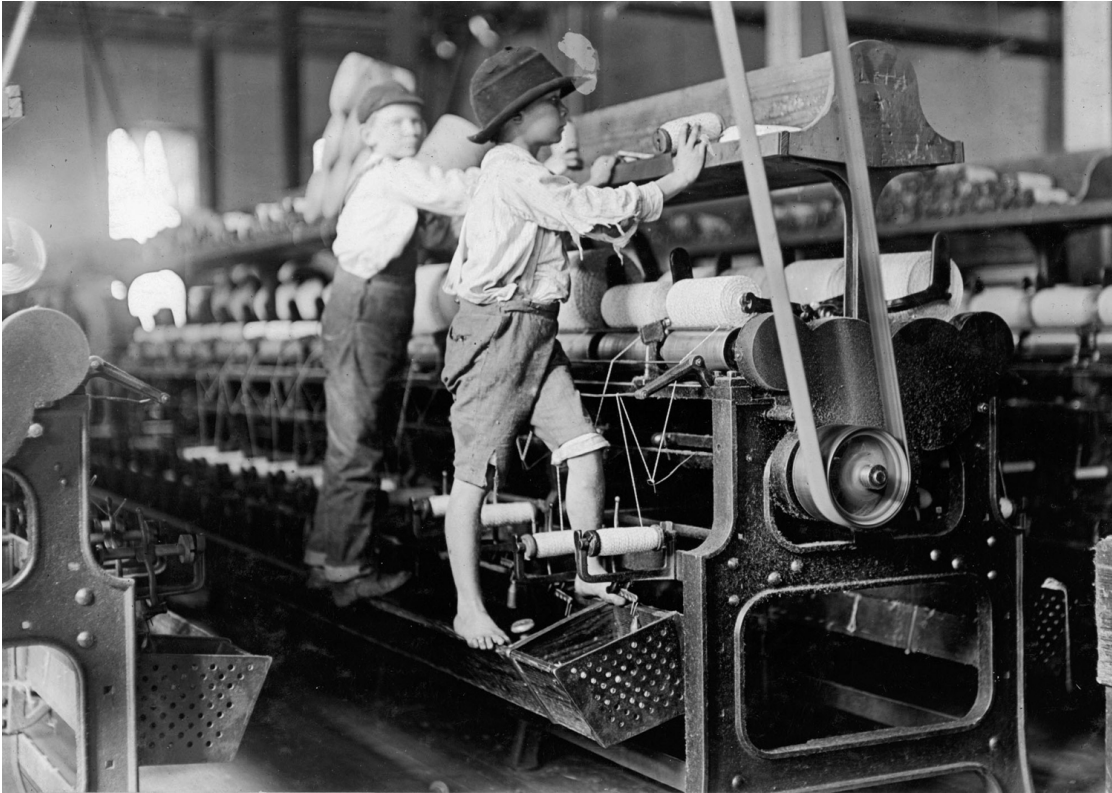


Plate 3 - Lewis Hine, *Mill Workers, Bibb Mill No. 1, Georgia, 1909*. Photo caption: "Some boys were so small they had to climb up on the spinning frame to mend the broken threads and put back the empty bobbins." Lewis Hine, "488 Macon, Ga. Lewis W. Hine 1-19-1909. Bibb Mill No. 1," Library of Congress, January 01, 1970, accessed May 02, 2018, <https://www.loc.gov/pictures/item/ncl2004001388/PP/>.

Hine's images are perhaps the most representative of what *ideological documentary* has looked like in the past and continues to be in the present. The photographs that he took with his box camera of children toiling in excessively dangerous conditions had a clear motivation behind them. They are *aesthetically coherent* depictions of children operating machinery and working under conditions that most would consider dreadful, or at the very least, incredibly unsafe. *Mill Workers, Georgia* [Plate 3], for example, shows two children, one barefooted, operating a mill that dwarfs their delicate frames. Their manner of dress offers a clear indication of their status in society as labourers, and their need to climb atop the machinery implies that they are far too small to operate it safely. By choosing to

take photographs that emphasized children's minute frames as close as possible to the looming mills or pressed between two long banks of heavy equipment, Hine emphasized the scale of the problems he witnessed and the powerlessness of the children to alter their societal conditions. Apart from their aesthetic, then, Hine's photographs were also political. Via documentary photography, he reacted to a particular injustice, motivated by a desire to alter perceptions of what was acceptable under the labour laws of the time.<sup>13</sup> Hine eventually left a teaching post in New York to enact his theory that the photograph could create change by rendering visible conditions such as these. Such lucid political coherence is typical and can be found in an incredibly wide array of image production practices, such as certain forms of documentary photography, investigative journalism, and human rights activism.

While much of what Hine accomplished was in the name of reforming the law, he also left a body of work that highlights the societal cost of incorporating new technologies in industrial America. Just as technologies of mass production were becoming more abundant in the American and global landscape, his photographs revealed a context where few were willing to do the work at the wages that were being offered.<sup>14</sup> He showed the adverse effects of the speed of technology. Many people were appalled by the notion that children were doing the hard labour typical of grown men, but Hine's images also suggest the unsafe, unhealthy, and overwhelmingly unsatisfying conditions of all manufacturing labour. They reveal dehumanizing work in which children as young as six-years-old operate the technologies of mass production, revealing how some within society value profitability over the safety and mental health of its workforce. While children had undoubtedly worked before the manufacturing revolution, perhaps on farms with

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<sup>13</sup> Hine left his teaching position at the Ethical Culture School in New York in 1908 to take a position at a non-profit called the National Labor Committee. He was a sociologist by trade and advocated for the potential of photography to be employed as a tool for social reform. While Hine was surely compensated for his work, one could argue that compensation was not his primary motivation, as demonstrated by over 20 years of social realist projects focused on humanitarian injustice.

<sup>14</sup> Hindman, *Child Labor*, 27.

their families, Hine's images revealed the shifting reality of lower class employment aided by disrupting, and often concealed, technologies.

Producers of ideological documentary are admittedly biased toward their motive or a cause: Hine produced his photographs knowing what he wanted to change. It functions today in a very similar mode, motivated by a variety of transmitters whether moral activists, corporations, intellectuals, or fringe thinkers. Ideology functions similarly in photo-journalism where images often accompany a moral story that at very least reflects the moral conscious of the culture it exists within. Therefore, a principal component of ideological documentary is an author's intent; often the photography itself offers no clear evidence of what is inherently accurate or misleading. What is gained by the producer, in this case, Hine, in the production of documentary images, is a loyalty (or perhaps an attempt at a realignment) toward a political position, whatever it may be. Hine's photographs showed the larger population that conditions in factories were unjust; quite the opposite sentiment that factory owners wished to represent.<sup>15</sup> The construction of documentary images remains as lively as ever, with competing ideologies vying for legitimacy and political significance. Galloway refers sympathetically to this type of image construction as "myth," and unsympathetically as "propaganda;" both contain the ability to create levels of facticity (or indisputable realities) where none inherently exist.<sup>16</sup>

As mentioned in the previous chapter, even institutions of science grapple with the duelling and oft-considered incompatible notions of value and objectivity. As Heather Douglas suggests in her defence of value in institutions of science, value is often a necessary component of judging what culture deems important enough to spend its resources on.<sup>17</sup> As such, value is a necessary component of informed decision making and should not necessarily be considered a negative. It is only when

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<sup>15</sup> For example, many business owners at the time claimed they simply could not afford to operate without child labourers, claiming that they were helping idle children out of poverty by working an "honest trade." See: Marjorie E. Wood, *Emancipating the Child Laborer: Children, Freedom, and the Moral Boundaries of the Market in the United States, 1853–1938* (Ph.D. diss., University of Chicago, 2011), 32.

<sup>16</sup> Galloway, *The Interface Effect*, 47.

<sup>17</sup> Heather Douglas, "Rejecting the Ideals of Value Free Science," in *Value-Free Science? Ideals and Illusions*, eds. Harold Kincaid, John Dupre and Alison Wylie (Oxford: Oxford University Press, 2007), 121-3.

the values of the disenfranchised are ignored in exchange for the benefit of a few that value judgements can be considered questionable. We might consider Hine's ideological documentary practices under this rubric: while his photographs primarily functioned as a form of propaganda, they also functioned as a form of value-laden research, where the greater social good was identified so that cultural norms could be reformed via the visualization of the disenfranchised.

Technology, including the photographic camera, can and is used by many authors as an apparatus of control and deception. As discussed in the previous chapter, and observed in the history of photography, the notion that technology is a tool that is politically neutral is inherently false. Its control and ownership offer many benefits to those who use it (i.e. owner/worker; government/citizen). Herbert Marcuse maintained that technology introduces problems that are not an accident of neutrality:

Scientific-technical rationality and manipulation are welded together into new forms of social control. Can one rest content with the assumption that this unscientific outcome is the result of a specific societal *application* of science? I think that the general direction in which it came to be applied was inherent in pure science even where no practical purposes were intended, and that the point can be identified where theoretical Reason turns into social practice.<sup>18</sup>

Andy Feenburg rephrases this point by asking what it means when formal systems, such as law or technology, are available for applications biased to favour domination.<sup>19</sup> Such a question restates the notion that there might be something about technology far beyond its physical construction that influences the way it functions in society, and which is most likely found within formal political systems such as capitalist democracy. A system that illustrates such a danger can be found within the "free press," which is often granted the status of neutrality and equal representation yet relies heavily on technical devices and political entities to relay its messages. An early analysis of the social control of the newsroom by Warren

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<sup>18</sup> Herbert Marcuse, *One Dimensional Man* (Boston: Beacon, 1964), 146.

<sup>19</sup> Andrew Feenberg, *Critical Theory of Technology* (Oxford: Oxford University Press, 1991), 169.

Breed outlines that owners of news outlets have the “nominal right to set a paper’s policy and see that all staff activities are coordinated so that the policy is enforced.”<sup>20</sup> While ethical journalistic norms, individual staff opinions, and ethical taboos regarding the formation of news mandates all work against notions of biased representation, ultimately, publishers also consider profit margins and varying political, business, and labour interests, when setting mandates.<sup>21</sup> According to Breed, social control within the newsroom is a result of staff members at all levels conforming to policies via institutional authority and sanctions, feelings of obligation and esteem for superiors, mobility aspirations, a general absence of conflicting group allegiance, the pleasant nature of the activity of journalism for some, and the production of news as a value in itself.<sup>22</sup> Such a range of political motivations, from policymaker to the individual, degrades hypothetical notions of any unbiased and factual reporting.<sup>23</sup>

How useful, then, are the technological tools meant to document and reveal, like the photographic camera? Even if a tool is used to reform and produce moral advances within a culture, its successes must be measured against the fact that those with greater access to resources and political control have an equally potent tool at their disposal. This is perhaps the most significant limitation of ideological documentary: that it *must* have a standpoint implies that bias is necessarily a part of its production, making its supposed neutrality suspect by its very nature. Because these notions are not implicit in any document produced *by* or *of* technology, it is not possible to distinguish any discernible facticity about what is being depicted, without scrutinizing the images in question with regards to contextual, political and aesthetic motivations of its author(s).

This reading of ideological documentary production, however, becomes somewhat less decipherable in the hands of a seemingly independent and at least

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<sup>20</sup> Warren Breed, “Social Control in the Newsroom: A Functional Analysis,” *Social Forces* 33, No. 4 (May, 1955), 326.

<sup>21</sup> *Ibid.*, 327.

<sup>22</sup> *Ibid.*, 329-31.

<sup>23</sup> Very little has changed in this regard since Breed conducted his study in 1955. One could convincingly argue that news bias has increased as newscasters have begun reaching new heights of celebrity themselves.

partially self-funded artist. As the brief discussion of scientific output and value-laden research above suggests, ideological documentary must exist in order to counter policies and political entities that run counter to a collective benefit. One such example of this is environmental degradation that benefits the few far more than the collective and global population. Edward Burtynsky's work, for example, represents landscapes so altered by resource-altering technologies that the scale of destruction must be beheld from an unusually wide and overhead angle of view. His photographic documents mimic the production of a potential omniscient overlord in the air, as the overseer of a megaproject that documents the Anthropocene. He continues to produce photographs that are unexpected and disquieting, primarily by merging the aesthetic conventions of compositional beauty with the sobering reality of the human reconfiguration of the landscape. As such, viewers are forced to address an inner turmoil that is the modern condition of technology and its artifacts. In several of his series documenting nickel tailings, garbage and recycling centres, and sprawling highway intersections, amongst others, the real spaces that Burtynsky photographs around the world inevitably become linked to local actions and emotions [Plate 4]. Our political views and desire for material objects may be provoked, much like the audience for Hine's work may have shifted their perspectives on child labour or the goods produced by it. The sweeping breadth of Burtynsky's collective body of work allows for the significant representation of a subject that is as complex as it is vast.

Was the proclaimed ambiguity to environmental concerns by Burtynsky a strategy to maintain his access to locations in the future, and to sell more work to the very corporations he had visited? Since these earlier stages of his career, and perhaps to avoid criticism from the environmental movement, Burtynsky has nevertheless taken a greater public stance in favour of environmentalism and ecological concerns, as shown in his reception of the TED prize and subsequent awareness-raising campaigns.<sup>24</sup> Regardless of his earlier claims, Burtynsky's

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<sup>24</sup> Edward Burtynsky, "My Wish: Manufactured Landscapes and Green Education," *Edward Burtynsky: My Wish: Manufactured Landscapes and Green Education | TED Talk*, August 15, 2017, accessed March 24, 2018, [https://www.ted.com/talks/edward\\_burtynsky\\_on\\_manufactured\\_landscapes](https://www.ted.com/talks/edward_burtynsky_on_manufactured_landscapes).



imaging strategy successfully links the production, consumption, and effects of large-scale technological disruptions to our landscape and contemporary politics, amongst other themes, offering a way for the general public to visually understand the often *under*-visualized impacts that human activity has on the planet. The irony of corporations holding valuable collections of Burtynsky's artistic production—which is culturally often celebrated for revealing devastated landscapes at the expense of corporate profits—arguably adds an even more significant depth to Burtynsky's oeuvre.



Plate 4 - Edward Burtynsky, *Highway #1 – Los Angeles, California, USA*, 50 x 60 inches, 2003. From the series *Manufactured Landscapes*, first exhibited at The National Gallery of Canada, Ottawa in 2003.

What does it mean, then, when citizens engage in political action and practice their democratic rights of moral inquiry through documentary photography? The practice of documenting moral injustice according to one's political stance simultaneously points to both the strengths *and* inherent limits of ideological



documentary. While an incredibly useful practice in certain situations, ideological documentary's political mode is always in danger producing confirmation bias rather than altering current perceptions.<sup>25</sup> While not always the case, far more confirmatory images shape our contemporary politics than do images we may refer to as "counter-ideological." As such, the revelatory power of images is increasingly subject to authorial motivation and manipulability, and the images themselves are received within a culture that is increasingly aware of their power to lie to consumers. Galloway suggests that contemporary culture is shifting from an ideological-centred one to an ethical-centred one for precisely these reasons. He reiterates that ethical does not suggest a more "ethical" climate in the traditional sense (good-deed-doing or less politicization), but rather more categorically as "adopting various normative techniques wherein aesthetic dominants are shattered."<sup>26</sup>

While we may understand Lewis Hine's ambitions, his photographs predominantly enacted change via their unveiling effect. Burtynsky's images certainly share a similar motivation in their revelation of a mass reconfiguring of the natural landscape via technology, but does photography and ideological documentary remain a useful tool given a far more hidden and more difficult subject to visualize, such as the increasingly less visible technologies of contemporary society? Can ideological documentary account for the emergence of cryptocurrency and social networks, the micro-effects of globalization, or the functioning of even the photographic camera itself? Such subjects are more difficult to represent precisely because they are less easily visualized than something like child labour. They are

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<sup>25</sup> Those less knowledgeable about both sides of a regional conflict, for example, have been found to be more susceptible to media bias. See Robert P. Vallone, "The Hostile Media Phenomenon: Biased Perception and Perceptions of Media Bias in Coverage of the Beirut Massacre," *Journal of Personality and Social Psychology* 49, no. 3 (1985): 577; Saul Kasssin, for example, has found that "[c]lassic psychological research on primacy, expectancy effects, and observer effects, [can] all...indicate that context can taint people's perceptions, judgments, and behaviors." See Kasssin, "The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions," *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 42.

<sup>26</sup> See Galloway, *The Interface Effect*, 52.

inherently anti-aesthetic: too hidden to be able to conform to aesthetics of coherence and resistant to vision altogether.

However, the revelatory power of documentary still has a place in a culture that continues to be transformed by technology in ways that remain relatively hidden to most consumers. The images of ideological documentary, however, are usually borne *a posteriori*, or, after the destruction of, say, the landscape or the enactment of deplorable child labour practices.<sup>27</sup> Images such as these are particularly suited to rendering (or envisioning) the accumulation of the past, but less potent in signalling potential ramifications in the present and future, which of course, would be more useful in our evaluation of the impact of emerging technologies. For example, fossil fuels were identified for their potential to cause global warming by John Tyndal in 1860. Today, however, even proof offered by scientists and image-makers does little to sway opinion on the damaging effects of fossil fuels for those who do not agree. Was there anything photography could have done to help us understand such a phenomenon more broadly?

As a timely example of the challenges and weaknesses of ideological documentary in the contemporary social climate, we may look to the very recent photographs depicting Donald Trump's inauguration. Public disagreement over the number of people present was provoked by questioning the legitimacy of news organizations, rather than through an analysis of our best sources of objective facticity (in this case photographs).<sup>28</sup> If notions of facticity can be dictated by someone with power and a particular political motivation by merely referring to photographs as fake news, what role can ideological documentary have in a "post-

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<sup>27</sup> While it could be argued that images such as Burtynsky's are contemporaneous with living experience, the cumulative effects of centuries of environmental manipulation could hardly be considered instantaneous. For example, "Highway #1 – Los Angeles, California, USA, 2003" shows a sprawling highway network grew slowly as the automobile became the primary mode of transport beginning almost a century ago. I consider such a photograph as one that illuminates cultural choice and its eventual consequences rather than one that disregards historical context. In fact, much of the power of Burtynsky's images results from the scale of alterations, which he represents not just pictorially but via references to time and accumulation.

<sup>28</sup> Lisa Rein, "Here Are the Photos That Show Obama's Inauguration; Crowd Was Bigger than Trump's," *The Washington Post*, March 7, 2017, Web, accessed March 24, 2018, [https://www.washingtonpost.com/news/powerpost/wp/2017/03/06/here-are-the-photos-that-show-obamas-inauguration-crowd-was-bigger-than-trumps/?utm\\_term=.17f54792c7d3](https://www.washingtonpost.com/news/powerpost/wp/2017/03/06/here-are-the-photos-that-show-obamas-inauguration-crowd-was-bigger-than-trumps/?utm_term=.17f54792c7d3).

truth” society? I argue that ideological documentary is still a critical tool for the identification and elaboration of sweeping technological changes and their resulting ecological and social impacts, mainly if they have significant and alarming visual manifestations; however, ideological documentary may be less valuable in identifying the threats and potentialities of emergent and less-visible technologies.



Plate 5 - Taryn Simon, *Bureau of Engraving and Printing, US Department of the Treasury, Washington, District of Columbia, 2007*. From the series *An American Index of the Hidden and Unfamiliar*, first exhibited at the Whitney Museum of American Art in 2007.

On the fringe of visibility, Taryn Simon’s photographic book, *An American Index of the Hidden and Unfamiliar*, contains images that reveal the contemporary manifestations of social and technical landscapes that remain hidden to protect political power holders who might be threatened by their revelation. These include photographs of locations such as the US Department of the Treasury, nuclear waste capsules, and a US customs and border contraband room [Plate 5]. However, perhaps Simon’s most illuminating examples are the images she tells us she was

unable to create, like the inner workings of The Walt Disney Corporation and its operation of the Disney World theme park. During an artist talk on the subject, Simon read a letter she received from the Disney Corporation in response to her request for access that outlines the devastating effect that photographs revealing the inner workings of Disney World (those hidden from consumers) would have on the Disney World brand.<sup>29</sup> Such a refusal on the part of Walt Disney World Corporation executives directs us to consider the power of invisibility within culture, and what is at stake for those who choose to make hidden elements of daily life. This is something that ideological documentary photographs can potentially contest. The act of “making visible” those aspects of a politics that manages to control via invisibility is a critical first step in allowing for a non-discriminatory, external analysis vis-à-vis public enlightenment.

Ideological documents are, however, constructed by an author and will always include a narrative due to the author’s stake in the work. Even when left ambiguous, as in Simon’s or Burtynsky’s projects, overarching narrative elements are often visible in the work, or at the very least, are implied by the relationships that are formed between the subject matter within. It would not be difficult to discern a narrative in Simon’s project, as the title itself implies a sort of active search for the hidden elements of American society, in which the photographer must overcome many hardships and reluctance in the search for facticity. Burtynsky’s work similarly implies a certain cyclical “human” narrative—an if/then relationship that has already occurred—in his choice to follow the life of commodities from their production to consumption, and their role in environmental degradation. Without a narrative, documents have little power in the contemporary visual landscape due in part to the aesthetic and political coherence that ideological documents require. I do not mean to suggest that narrative in documentary is something to be avoided, but rather that its limitations should be considered against its implications: that

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<sup>29</sup> Taryn Simon, “Photographs of Secret Sites,” *Taryn Simon: Photographs of Secret Sites* | TED Talk. TED.com, web, accessed March 24, 2017, [https://www.ted.com/talks/taryn\\_simon\\_photographs\\_secret\\_sites](https://www.ted.com/talks/taryn_simon_photographs_secret_sites).

narrative implies an author with a motive, who is often responsible for the construction of myth/propaganda. There are times when strong messages are necessary in order to combat authoritative, hegemonic forces; when making the invisible visible is necessary for illuminating the hidden and prejudiced. However, by the time a hegemonic politic has been revealed to a greater public, and cumulative and damaging effects can be visualized via the camera, physical ramifications may potentially be challenging to reverse.<sup>30</sup>

The representation of technology and the technical codes that direct power relations, as discussed in the previous chapter, are becoming more difficult to trace visually within contemporary culture. For example, the corporations that most influence our contemporary society and culture (along with our physical and social landscapes) have shifted significantly in output over the past several decades. In 1955, corporations such as General Motors, Exxon Mobil, and U.S. Steel topped the Fortune 500's long list of mainly manufacturing corporations ranked by revenue.<sup>31</sup> Such corporations rely on technologies that are (and whose outputs are) highly visible to the human eye, and thus recordable by the photographic camera. Contrastingly in 2017, the above list is primarily populated by corporations such as Amazon, Facebook, Berkshire Hathaway and AmerisourceBergen; corporations that produce no physical objects but rather fabricate and manipulate networks of data and information.<sup>32</sup> Considering the corporations that top the Fortune 500 list represent two-thirds of America's gross domestic product, it is reasonable to consider them as having the potential to alter both our physical and social

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<sup>30</sup> Here one might seriously consider images that can *only* be constructed after serious societal costs have come to pass, such as: the stripping of rainforests from South America, the effects of globalization on economically unstable regions, the effects of global warming, mass poverty, and nuclear disaster. For example, Montreal artist Isabelle Hayeur's ongoing photographic project titled *Underworlds* documents the disturbing and man-altered "aquatic landscapes" that highlight "[e]cological disasters such as the oil spill in the Gulf of Mexico or the garbage slates forming on the oceans...[and] impoverished bio-diversity." Isabelle Hayeur, "Underworlds," Isabelle Hayeur: Photography, accessed April 17, 2018, [https://isabelle-hayeur.com/photo\\_en.html](https://isabelle-hayeur.com/photo_en.html).

<sup>31</sup> Fortune 500 Companies - Archived List of Best Companies from 1995, accessed April 17, 2018, [http://archive.fortune.com/magazines/fortune/fortune500\\_archive/full/1955/](http://archive.fortune.com/magazines/fortune/fortune500_archive/full/1955/).

<sup>32</sup> "Fortune 500 Companies 2017: Who Made the List," *Fortune*, accessed April 17, 2018, <http://fortune.com/fortune500/list/>.

landscapes significantly.<sup>33</sup> We are now collectively learning what impact a half-century of oil and steel production can have in such a context, but the future realities of data producing and manipulating corporations, over the next several decades even, is much less clear. What may cause significant cultural and societal ruptures in the next century may no longer be recordable by silver or a CCD chip—physical objects that resemble things we would refer to as technology in the modern era. The Facebook scandal involving the manipulation of millions of user accounts to sway the recent political election, for example, provides a cogent example of the technology that resides hidden from the public and is difficult to visualize.<sup>34</sup> Technologies and instruments that incorporate black-box-like effects, where the function remains hidden in an indeterminate aesthetic form and across vast distances, such as computers, electronic devices, and networks (social, communications, banking, etc.), are inherently more difficult to capture visually, and thus new strategies must be mined in order to make the invisible visible again. It may be more useful to reframe techno-culture as a form of Disney World (in both a Baudrillardian *and* less abstract sense), where the functions and end-uses of technologies have two independent yet bonded functions: one for the consumer and another for the producer. Ideological documentary *does* have the ability to illuminate the physical manifestations of humanmade technologies as we have seen above, but it may not be able to depict underlying shifts in power relations so straightforwardly. This is in part due to its inherent connection to power dynamics as discussed, but also a problem of photography more generally, that is, its inherent limits as a primarily visual medium. We will continue our investigation into this problem by examining other modes of documentary production, mining alternative and more suitable approaches to such increasingly complicated visual privations.

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<sup>33</sup> Ibid.

<sup>34</sup> Emma Graham-Harrison and Carole Cadwalladr, "Revealed: 50 Million Facebook Profiles Harvested for Cambridge Analytica in Major Data Breach," *The Guardian*, March 17, 2018, accessed March 24, 2018, <https://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election>.

## 2.3 ETHICAL DOCUMENTARY



Plate 6 – Robert Frank, *Drive-in movie—Detroit*, 1955. From the series *The Americans*. As a bookwork, *The Americans* was first published in 1958, with a forward written by Jack Kerouac.

Robert Frank received many criticisms for his book titled *The Americans* when it first appeared in 1958.<sup>35</sup> Frank's work has since been widely debated, and here serves to illustrate photographs that defy aesthetic conventions yet maintain political coherence, both because of their blunt rejection of aestheticism, but also for their subject matter.<sup>36</sup> When first published, *The Americans* was condemned for its aesthetic banality and apparent lack of care for photographic composition [Plate 6]. Frank challenged conventional approaches to focus and framing, and denied the general conception that a single image was enough to convey a cohesive message, all while displaying aspects of American life that many people would have rather not seen. As a partial outsider to American culture, Frank often turned his camera on scenes of emptiness and segregation, landscapes dominated by the automobile, and a culture arising out of class conflict. This, of course, was not how America was

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<sup>35</sup> Robert Frank, *The Americans* (New York: Grove Press, 1958).

<sup>36</sup> For an expanded dialogue regarding the social context and history of Frank's work, see Sarah Greenough and Alexander Stuart, *Looking In: Robert Frank's The Americans, Expanded Edition* (Washington, D.C.: National Gallery of Art, 2009).

portrayed in popular culture, and his work won little acceptance outside of the art world until much later.<sup>37</sup>

The mechanical qualities of the camera acquired supreme importance after the Pictorial movement of the early 1900's. As early as 1916, critics such as Sadakichi Hartmann advocated for "straight" photography that did not "overstep the boundaries and deliberately mix up photography with the technical devices of painting and the graphic arts," asking, "[w]hy then should not a photographic print look like a photographic print?"<sup>38</sup> Exploitation of the camera's ability to generate extremely lucid, carefully composed, and aesthetically concentrated images remained the principle way in which documentary photographs were presented into the 1930's when the term *documentary* first came into wide usage.<sup>39</sup> Photographers such as Walker Evan, Eugène Atget, and August Sander were celebrated for their ability to represent, with uncanny detail and supposed realism, everyday life. The notion that the photograph required flourishes of artistry, such as an exaggerated depth of field and simulated colour to be accepted as art was exchanged for the idea that photographs were most useful when they adhered to their strength—their supposed ability to represent with mechanical precision and technical efficiency while maintaining a singular and individual voice.<sup>40</sup> This sentiment was partially shaped at the time by Clement Greenberg, who despised the notion that the photographer had to simulate other forms of accepted art practice:

If one wants to see modern art photography at its best let him look at the work of Walker Evans, whose photographs have not one-half the physical finish of [Edward] Weston's. Evans is an artist above all because of his original grasp of the anecdote. He knows modern painting as well as Weston does, but he also knows modern literature. And in more than one way photography is closer today to literature than it is to the other graphic arts. (It would be illuminating, perhaps, to draw a parallel between photography and

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<sup>37</sup> Howard S. Becker, "Photography and Sociology," *Studies in Visual Communication* 1, no. 1 (1974), 9.

<sup>38</sup> Sadakichi Hartmann, "A Plea for Straight Photography," in *Photography: Essays and Images*, ed. Beaumont Newhall (New York: Museum of Modern Art, 1980), 185-8.

<sup>39</sup> Mary Warner Marien, *Photography: A Cultural History* (London: Laurence King Publishing, 2006), 276.

<sup>40</sup> For an in-depth historical analysis of this moment, see Christopher Phillips, "The Judgment Seat of Photography," *October* 22 (1982): 27-63.



prose in their respective historical and aesthetic relations to painting and poetry.) The final moral is: let photography be “literary.”<sup>41</sup>

Greenberg understood the “art” in photography to be different from all other art forms, unlike the photographs produced by Edward Weston, which Greenberg described as “arty” rather than art that took advantage of the camera’s specific capacities.<sup>42</sup> This notion ran counter to Surrealist approaches at the time of artists such as Man Ray and Brassai, who used photography to speak about the Freudian unconscious in works that often consisted of gross distortions and material explorations. While many surrealists used strategies such as double exposure, combination printing, montage and solarization to evoke the union of dream and reality, several less material strategies were also employed. For example, Jacques-André Boiffard often photographed close-ups of isolated bodily fragments such as the toe, the head and the mouth, as they emerged from darkness, creating a very life-like yet abstracted and oversized example of the human body. Boiffard, in the preface of *La Révolution surréaliste*, referred to such images as “surrealist facts,” stating the “[e]very discovery that changes the nature, the destination of an object or of a phenomenon constitutes a surrealist fact.”<sup>43</sup> Rosalind Krauss identified the power of surrealist photography to “preserve the seamless surface of the final print and thus re-enforce the sense that [an] image, being a photograph, documents the reality from which it is a transfer,” referring to the “facticity” of the photography, or its privileged relation to the real.<sup>44</sup> This relationship between surrealism and photography is often considered tenuous, however, with many surrealist works frequently missing the mark, as Teju Cole describes: “what is lost is inadvertency and the element of surprise — the sense that the power of the image is independent

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<sup>41</sup> Clement Greenberg, *The Collected Essays and Criticism*, Volume 2: *Arrogant Purpose, 1945-1949*, ed. John O’Brian (Chicago: University of Chicago Press, 1988), 63.

<sup>42</sup> *Ibid.*, 61-64.

<sup>43</sup> Paul Eluard, Roger Vitrac, and Jacques-André Boiffard, “Préface,” *La Révolution Surréaliste* 1, no. 1 (December 1924): 2.

<sup>44</sup> Rosalind E. Krauss, *L’Amour Fou: Photography and Surrealism* (Washington, D.C.: Corcoran Gallery of Art, 1985), 28.

of the photographer's plans."<sup>45</sup> This is precisely why the photographs of Eugène Atget, a photographer documenting the empty streets of Paris as if they were an elaborate still-life set, were heralded by surrealists such as Man Ray (and even used on the cover of *La Révolution Surréaliste*). As it happens, many of the most successful surrealist photographs ended up being what we might call "straight photographs" today. Indeed, many artists and enthusiasts eventually rallied around the notion that the content and subject matter of photographs were where the freedom and expression of photography was most valuable, and agreed upon general notions of aesthetic coherence: sharp, well composed, and technically proficient photographs made the best use of the camera as an instrument of representation. In terms of documentary photography, this particular style has endured and will be discussed further in the following section.

Frank's blunt departure from the conventions of the above modernist photography ingeniously aligned the technical use of the camera to the subject matter he was attempting to represent.<sup>46</sup> His blurry, shaky, and (initially-considered) poorly composed images introduced a different form of a documentary image that concerned itself less with aesthetic convention or surface representation, and more with a desire to reveal an America that defied then-current public perceptions (both insider *and* outsider). America was not a highly polished society without problems and ugliness, and Frank embraced the falsity of such framings. By using a technique that was aesthetically jarring, he revealed a grittier picture of American life, remarkable for how it destabilized the myth of a problem-free America using the same propaganda tool as capitalist and political enterprises used: the power of the photograph to construct an image. By subverting common tactics, Frank constructed an opposing force that denied dominant hegemonies articulated using a singular voice. While *The Americans* has traditionally been viewed through

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<sup>45</sup> Teju Cole, "Strangely Enough," The New York Times, October 18, 2016, accessed April 18, 2018, <https://www.nytimes.com/2016/10/23/magazine/surreal-photography.html>.

<sup>46</sup> In 1924 the Leica camera, a compact technical tool that brought new freedoms to photographic practice, introduced new possibilities to the photographer's repertoire. If the cumbersome but highly detailed large format camera was particularly suited to the static subject, the opportunities provided by the hand-held camera included a re-imagining of the artist camera's functions.

the lens of social critique, the elements of its construction along with its subject matter also served to reflect a social landscape reformed by modern technologies such as mass media (misrepresentation), the proliferation of car culture, and of course, refinements in the technology of the photographic camera as a small and unassuming pocket-sized instrument. These elements highlighted the evolutionary capacity of the photographic camera to unveil new analyses as cultures and technologies changed.

This type of documentary, which I call *ethical documentary*, is inherently visual in nature and relies on upending the ways documentary photographs are constructed in order to undermine singular control of the visual field. Throughout the history of images and popular culture, as introduced briefly above, this strategy manifests itself in many ways. Other examples across visual culture include the introduction of low-budget and renegade film techniques such as those used in *The Blair Witch Project* (1999), which successfully subverted the dominant force of the Hollywood film industry, and ruptures of artistic production such as Edward Ruscha's *Twentysix Gasoline Stations* (1968). These works successfully offered visual producers new possibilities to explore within their attempts at representation, while upsetting the political status quo.

Just because ethical documentary produces images that are aesthetically incoherent does not mean that they are also unintelligible. Rather, they defy the aesthetic conventions of their time. Frank's photographs were not the beautiful representations of America consumers expected. *The Blair Witch Project* introduced amateur equipment and handheld cinematography to Hollywood, and Ruscha created photographs that emphasized a banality that was content in its irony and cared little for conventional aesthetics and grandiose subject matter. Developing alternative visualization strategies that are counter to conventional modes of representation, use the camera in new ways, and that upset aesthetic norms, enacts Haraway's *Situated Knowledges* in a productive way. Without documentary photography that privileges contestation, deconstruction, passionate construction, webbed connections, and hope for the transformation of systems of knowledge and ways of seeing, the photographic instrument becomes inert and ceases to evolve.

Such strategies make ethical documentary an incredibly useful tool, particularly in times when we find our visual vocabulary inadequate for representing and reflecting our culture *or* unable to combat dominant forms of repressive visual communication.

The efficiency/inefficiency of the visual tools we use to describe our world can be attributed to various notions explored in the previous chapter. Through Baudrillard's theory of Simulation, for example, we can begin to understand that any notion of reality is becoming more challenging to represent due to the erosion of our growing vocabulary of symbolic exchange through a lack of tangible, or "real," referents.<sup>47</sup> In an increasingly digital and visual culture, images and how they are used have decreasingly direct and inherent links to the physical, making their legibility susceptible to a variety of shifts in meaning throughout their chain of referents. Both Virilio and Crary describe a visual culture that induces perpetual trauma via constant change.<sup>48</sup> There is little doubt that consumers of visual culture seek familiarity in their consumption in order to make sense of the world. A reliance on familiarity can quickly lead to control over the symbols of exchange, as voices deemed unintelligible are either ignored, as they fit no easily digestible frame of reference, or worse, attacked for their dissenting qualities. As Heidegger explains, the technologies of representation should not be considered tools in any physical sense, but modes of Enframing that hinder the possibility of encountering the world as it is.<sup>49</sup> We become part of a chain of ordering; become part of technology as passive users within a network where revelation is less critical than consumption. Technology becomes a potentially useful tool for those in positions of power where the natural advantage lies in the producer's hands. So how can the production of ethical documents (aesthetically incoherent/politically coherent) combat the legible and dominant forms within culture with the less legible, given its form that might be difficult to decode for the consumer immediately? Practitioners of ethical

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<sup>47</sup> Jean Baudrillard, *Simulacra and Simulations* (Chicago: University of Chicago Press, 1994), 3-7.

<sup>48</sup> Paul Virilio, *The Original Accident* (Cambridge: Polity, 2007), 38-40; Jonathan Crary, *24/7: Late Capitalism and the Ends of Sleep* (New York: Verso, 2013), 45.

<sup>49</sup> Martin Heidegger, "The Question Concerning Technology," in *The Question Concerning Technology and Other Essays*, transl. William Lovitt (New York: Garland Publishing, 1977), 7.

documentary must often find novel ways of transcending traditional modes of aesthetic production, in ways that aestheticize the deconstruction of stale aesthetic patterns, while also constructing a clear politic of reforming of the apparatus towards unsettling hegemonic control of the visual apparatus. Several contemporary artists' works are worth considering within this mode of production and will be used to demonstrate such strategies within documentary photography.

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Plate 7 - Richard Mosse, *Vintage Violence*, digital C-print, 72 x 90 inches, 2011.  
From the series *Infra*, first exhibited at Jack Shainman Gallery, New York in 2011.

Initially developed for camouflage detection, the aerial reconnaissance film called *Kodak Aerochrome* registers an invisible spectrum of infrared light, rendering a forest canopy in vivid hues of lavender, crimson, and hot pink. While many might consider this film an unlikely choice for the documentation of rebel groups in East Congo, photographer Richard Mosse chose this film stock while photographing there to reinvigorate a dominant and timeworn brand of conflict photography [Plate 7]. As Susan Sontag and several other cultural theorists have explained, an element of

visual fatigue and disconnection results from the often brutal images of war and conflict, rendering images that were once potent agents of change into ones ignored within a culture of mass reproduction.<sup>50</sup> Even worse, in an effort to regain lost agency within visual culture, many photojournalists have resorted to over aestheticizing and sometimes overtly manipulating their photographs.<sup>51</sup> In this context, Mosse's choice of infrared film does several things: it raises the issue of aestheticism in conflict photography; it fosters an awareness of the limits of camera representation by considering photography as a visual medium with many inherent assumptions of facticity; and it considers the camera as a tool of technological control, in this case, developed as a way of identifying manmade structures in jungle warfare (thus offering a strategic advantage). Finally, and maybe most importantly, Mosse's photographs are so different from normative journalistic images that they regain an element of power, allowing viewers to *see again* and *differently* something they have likely seen many times before. His works can cut through viewer fatigue because of their aesthetic incoherence. Aesthetic incoherence again does not imply complete illegibility on the part of the viewer, but instead, visually differences itself enough from conventional aesthetics to reframe visibility again. Mosse's photographs introduce their own aesthetic which makes conflict and technologies of death visually enticing again, and thus, somewhat, counters their effectiveness in *ethically* reproaching its subject matter. However, the photographs introduce a novel visual form and a coherent message regarding the medium of documentary photography and the notion of aesthetic exhaustion by running counter to many photographic conventions.

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<sup>50</sup> See Susan Sontag, *Regarding the Pain of Others* (New York: Farrar, Straus, and Giroux, 2003); and David Campbell, "Representing Contemporary War," *Ethics & International Affairs* 17, no. 2 (2003), 99-108.

<sup>51</sup> See Marco Solaroli, "Toward A New Visual Culture Of The News: Professional Photojournalism, Digital Post-Production, and the Symbolic Struggle for Distinction," *Digital Journalism* 3, no. 4 (2015), 513-532.





Plate 8 – Erik Kessels, *24hrs in Photography*, Installation at Foam Amsterdam , 2011.  
© Photo: Gijs van den Berg.

Indeed, the issue of abundance and viewer fatigue is a growing area of investigation as a result of the introduction of digital photography and the many new ways of disseminating images via technology. Erik Kessel's installation project titled *24HRS IN PHOTO* (2011) navigates the seemingly limitless digital landscape of photographs taken, uploaded, and shared via the Internet's many image-sharing websites [Plate 8]. The project entailed the printing of one million photographs, the approximate number uploaded to Flickr every day at the time of the project and placing them in a confined physical space. The sheer number of images, when piled in the gallery overwhelms visitors with their incomprehensibility, providing an intriguing point for contemplation. In this case, it is not the taking of the photographs that introduces a new aesthetic form, but the physical mass of images in physical space that represents photography's new life as a digital medium. Kessel is motivated by a desire to shift observer perspectives via reconfiguration of the visual field—of imagining digital space as grounded in the physical—and succeeds in inventing a relationship between that which cannot be seen and at least some notion of visibility (if not full legibility). Kessel's arbitrary choice of a twenty-four-hour period reinforces that what he printed remains irrelevant in any useful aesthetic

sense. Finally, the sheer scale of the mass of photographs in relation to the viewer imparts a message regarding digital technologies that tends to remain hidden: the nature of this new technology is sprawling, connected, difficult to visualize, and ultimately overwhelming to our physical senses. We learn that translating the digital into the physical realm, while possible, is ultimately an unsustainable and irrelevant gesture, thus introducing a fundamentally diverging dialogue between the two media.

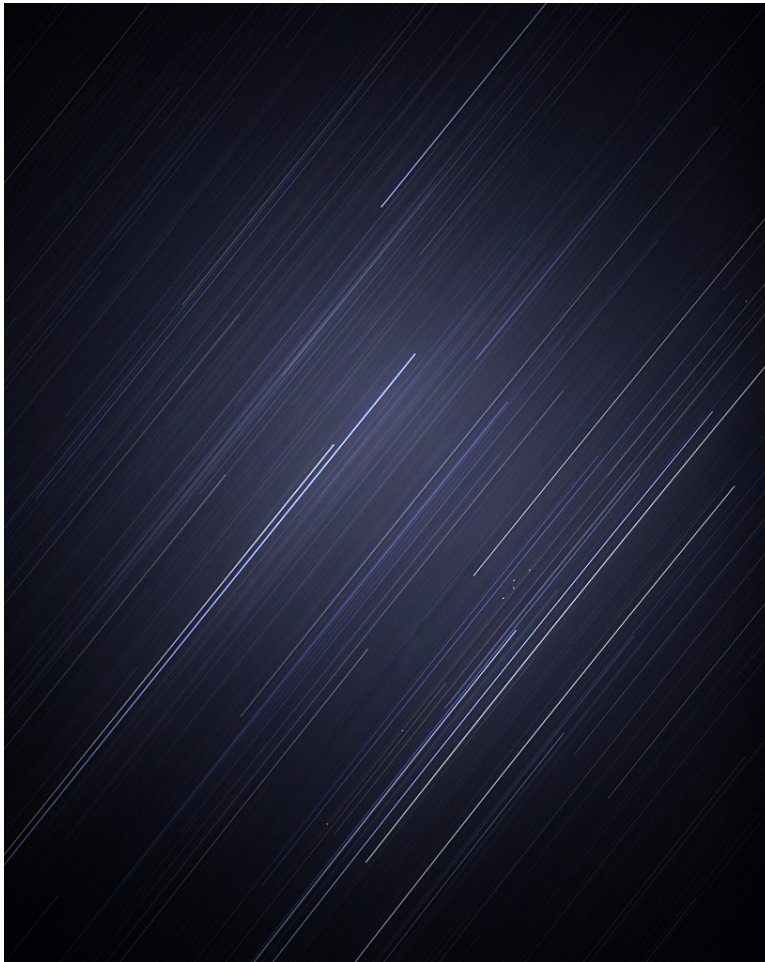


Plate 9 - Trevor Paglen, *PAN (Unknown; USA-207)*, 60 x 48 inches, 2010-11. From the Series *The Other Night Sky*. Image caption: This image depicts an array of spacecraft in geostationary orbit at 34.5 degrees east, a position over central Kenya. In the lower right of the image is a cluster of four spacecraft. The second from the left is known as "PAN." Source: <http://www.paglen.com/?l=work&s=othernightsky>.

Trevor Paglen, an American multidisciplinary artist, uses another approach to foreground the apparatus of the camera. Paglen uses digital images to track and



photograph classified American satellites, space debris, and other obscure objects in earth's orbit. Using observational data produced by an international network of amateur satellite observers to calculate the position and timing of overhead transits, he photographs such phenomena via telescopes, large-format cameras, and other imaging devices. Paglen's final photographs show skylscapes marked either by trails of sunlight reflecting off the hulls of obscured spacecraft hurtling through the night or by a dark path hidden within an otherwise typical long exposure star-trail photograph [Plate 9]. The effect captures something that cannot be seen by the human eye; which can only be revealed through an absence within the resulting image. Such documents visualize the invisible by manipulating the apparatus to expose an instrument that is meant to remain invisible, bringing awareness to the notion that more conventional methods of capture would reveal nothing at all. In this way, Paglen's project is a clever social revelation of the technologies hidden from daily life, but also a critique of a tool—the camera—that must be used in counterintuitive ways in order to serve its intended function of enlightenment.

Another example I will explore is the artistic output of German artist Thomas Ruff, who dissects the photographic apparatus to question the photograph as it transitions into a purely digital entity. Ruff's early career consisted of displaying highly detailed portraits taken with an 8" x 10" view camera at a scale abnormal for the time. The results could be described as oversized passport photographs, in which care is taken to record as little emotion and context as possible [Plate 10]. The combination of subject matter and scale result in an aesthetically confusing gesture for viewers, as the utility of portraiture is typically tied to its ability to say at least a little about its chosen subject.<sup>52</sup> Denying the entry of any superfluous elements into the frame, Ruff effectively argues that little can be discerned from a photograph as an object, and that one must rely almost entirely on contextualization in order to understand it. Any assumptions that result from viewing an intimately large Ruff

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<sup>52</sup> And in other cases, historically, it was hoped it could say much more. One immediately thinks of the "Synoptic Table of Facial Expressions for the Purposes of Systematic Identification" developed by Alphonse Bertillon and held in the Musée de la Préfecture de Police in Paris. Bertillon created a grid of facial features that might suggest a propensity toward, and inevitably help to catch, repeat criminal offending. See Marion, *Photography: A Cultural History*, 222-5.

portrait are most likely the result of the viewer's context (biases, past experiences, other photographs, etc.) constructed and accumulated over time. As a result, Ruff presents the camera, in part, as a highly influential technology that in fact struggles where it is often thought to be of most use—as some truthful documenter with inherent revelatory qualities.



**Plate 10 - Thomas Ruff, Installation of *Porträt* Series (1996-present), photograph sizes: 1600 x 1205 mm. Courtesy of David Zwirner Gallery.**

As the camera has broadened its capacities as a technological object, Ruff has evolved his questioning of the medium. His *Nacht* (1992-1996) series employs state surveillance infrared night vision technology to capture “everyday” scenes, thus making the viewer consider the effects of the “interfaces” that make up and define military forms of image capture [Plate 11]. These photographs are an effective strategy for enlightening viewers about the often encoded (but not obviously so) interface of a photograph. In a discussion regarding his practice with Diane Smyth of *The British Journal of Photography*, Ruff stated, “[t]he difference between my

predecessors and me is that they believed to have captured reality and I believe to have created a picture. We all lost, bit by bit, the belief in this so-called objective capturing of real reality.”<sup>53</sup> Indeed, Ruff’s projects serve to introduce new aesthetic strategies to subvert our usual ways of seeing both the camera and the technologies hidden behind/within it.



**Plate 11 - Thomas Ruff, *Nacht 12*, 18.5 x 18.75 in., 1992. From the series *Nacht* (1992-1996).**

How images function and their transition into a digital state play a critical role in Ruff’s other works, such as the projects *Maschine* (2005), *JPGS* (2007), and *nudes* (2012), where traditional documentary practice is temporarily confused by his visual gestures. For example, the apparent deterioration of imagery in large exhibition prints of the photographs found in *JPGS* becomes more apparent as viewers move closer to the 269 x 364 cm large prints. Symbolic breakdown is explored through iconic and recognizable imagery, and is set against a backdrop of reduced resolution and readability in the digital-visual world. The closer we get to

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<sup>53</sup> Diane Smyth, “From the BJP Archive: Thomas Ruff,” *British Journal of Photography*, March 7, 2017, accessed March 24, 2018, [www.bjp-online.com/2017/08/from-the-bjp-archive-thomas-ruff/](http://www.bjp-online.com/2017/08/from-the-bjp-archive-thomas-ruff/).

Ruff's images in the gallery, the less legible they become, which runs counter to the intuitive mode of visual examination. Within the bookwork produced under the same title, we are introduced to pleasant and neutral images first, but as the viewer progresses through the book, Ruff's subject matter gets noticeably more morose. Such sequencing may allude to the potential negative ramifications of trading high-resolution and tangible physical objects for the increasingly intangible and fleeting digital image. There are many possible readings of Ruff's work, but it is ultimately underpinned by a desire to expand the visual language of photography and introduce incoherent aesthetic forms into a politics of broadening, rather than limiting, our understanding of images and the usefulness of the artist's camera.

Thomas Ruff studied under the highly influential photographers Bernd and Hilla Becher during the conceptual art boom of the 1970s. The Bechers' photographs document the highly aesthetic forms of rural farming structures, developing a distinct link between the form and function of their subject. Their subtle approach to photographing their subject matter—including water towers, grain elevators, and framework houses—emphasizes the individuality of each structure through a disciplined and methodological approach, such as only photographing on overcast days and from a repetitive profile perspective. The resulting photographs are then presented via "typologies," displaying similar structures in a grid format. What the Bechers accomplished, amongst other things, could be considered the visualization of a turning point within the capacity of the photographic camera to record elements of technology directly. In this case, the Bechers' images depict industrial architecture that bears the visual cues of their functions, but doing so becomes more difficult as structures shift towards uniformity and a generic appearance.<sup>54</sup> In their capture of forms that visualize function, and vice versa, and in their capture of humanity and individuality within industrial architecture, which is quickly fading, the Bechers

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<sup>54</sup> Speaking of later attempts to continue their work, Hilla Becher described a disinterest with contemporary architectural forms such as water towers found in North America, describing them as visually banal, unexceptional, and ultimately lacking any human elements. See: William Klein, "Bernd and Hilla Becher," *Contacts Volume 3: Portraits of Contemporary Photographers*, video, 7:58, accessed March 24, 2018, <https://www.americansuburbx.com/2011/02/asx-tv-bernd-hilla-becher-contacts-vol-3-2010.html>.

foretell a future headed toward the unrepresentability of techno-objects. All of the world's water towers, for example, were on the cusp of looking the same from a photographic perspective, revealing little to the viewer of their inner workings. While this may not seem overly pressing in the realm of water towers, it represents a veiling of the camera's ability to document the inner workings of contemporary technology.<sup>55</sup>

Bernd and Hilla Becher and their students are now referred to as the "Dusseldorf" school for their collective influence over documentary photography, which has helped to shift the practice to a more self-reflexive medium. Another contemporary member of this school, Thomas Struth, carefully chooses his subject matter in ways that reflect on the camera itself as a technology with shifting representational capacities. In the mid-2000s, Struth negotiated access to NASA's construction and repair facilities in Florida. Struth describes the resulting photographs, which include images of masses of unintelligible electronic components, as presenting an "emotional entanglement" for viewers.<sup>56</sup> These images, however, do not necessarily construct an aesthetic of incoherence within their image structure, but rather rely on their subject matter to do so. While we know generally what the components in the frame are made of (various metals and wires, etc.), though even after considerable viewing only a highly trained engineer might attempt to fathom the real purpose of the objects pictured. Just like the shape of a water tower, electronic components can only be represented by their form, which says nothing of their complex internal function.

The subtle differences highlighted in the typologies that the Bechers and their students present are only possible because of the functional forms of industrial structures, which fall inherently within the photographic camera's visual range/capacity. While digital technologies do have logical and utilitarian functions built in, they are hidden from the camera's capacity to record and represent due to

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<sup>56</sup> Paul Later, "Thomas Struth's New Photos Stare Death in the Face," *Vice Garage*, November 24 2017, accessed March 24, 2018, [https://garage.vice.com/en\\_us/article/evb8nk/thomas-struth-new-photos-marian-goodman-gallery/](https://garage.vice.com/en_us/article/evb8nk/thomas-struth-new-photos-marian-goodman-gallery/).

the black-box effect of contemporary physical objects. As such, a critique of the aesthetic coherence of technology can only go so far toward revealing a more diverse understanding of instruments. Struth, ultimately, employs strategies that are more fitting for discussion in the following section, where the limits of vision can potentially be surmounted via strategies that engage with the interpretable nature of the symbolic to construct novel relationships.

Ethical documentary is perhaps most well-suited for explorations into how the camera functions, and how it can continue to evolve via creative applications of it. Many of the artists discussed above challenge conventional uses of the camera, or employ it in such a way as to highlight the limitations of more straightforward approaches towards capturing a subject. As Paul Feyerband suggests in *Knowledge, Science and Relativism*, allowing for alternatives strategies in the production of knowledge truly represents an opportunity, with few guarantees, to create something unexpected.<sup>57</sup> Employing technologies such as the camera in ways not initially intended is a starting point in this venture, which will continue to be explored in the following section.

## 2.4 POETIC DOCUMENTARY

For sophisticated viewers, and those willing to decode visual strategies, Struth's images introduce a different approach to documentary production that I will refer to as *poetic documentary*. In this category, images are aesthetically coherent from an artistic perspective yet exist within a politics of incoherence as their motivation and subject matter are open to interpretation. In a historical sense, such images share a similarity to "straight" photographs, a designation often used to refer to images that are created with the camera and no other manipulative

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<sup>57</sup> Paul K. Feyerband, *Knowledge, Science and Relativism* (Cambridge, UK: Cambridge University Press, 1999), 205-6.



devices.<sup>58</sup> Within the rubrics of Galloway's regimes of signification, this category can most simply be understood as *poiēsis*, or meaning-making, or, the production of cultural documents that are supposedly removed from a singularly commercial application. They can also be referred to as "fine art."<sup>59</sup>

In Thomas Struth's photographic series titled *Paradise* (1993-1999), we are presented with rainforest landscapes that seem filled with detailed depictions of endless and dense foliage [Plate 12]. While viewers are fully aware of the general context of what they are looking at when surveying these images, they may be less sure of the subject or what the artist intended. Nigel Pitman, a scientist who led one of the research stations that Struth visited to produce these photographs, afterward published an essay in which he admitted a long-held confusion with the photographs



Plate 12 -  
Thomas  
Struth,  
*Paradise 07*  
(Peru), 90 ¾  
x 70 inches,  
2002. From  
the series  
*New Pictures  
from  
Paradise.*

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<sup>58</sup> A "Straight Photograph" is one that does not use digital manipulation, lens filters, artificial lighting, or any other means of altering the appearance of what the camera records through its lens.

<sup>59</sup> Since it would be difficult to argue that fine art is somehow protected from commerce in any real sense, it is best to think of fine art's potential to produce meaning and new knowledge within culture, and that this is ultimately independent from notions of monetary exchange. While art objects can be and are purchased daily, the ideas and questions that they represent cannot be owned, therefore artworks constitute a special-case commodity. There is much debate over art's status as a commodity; however, it is important to separate the art object from its potential to produce new forms of knowledge. Galloway refers to art's alignment with meaning-making as *poiēsis*. For a detailed exploration of art's status as a commodity see Dave Beech, *Art and Value: Art's Economic Exceptionalism in Classical, Neoclassical and Marxist Economics* (Chicago: Haymarket Books, 2015).

Struth produced.<sup>60</sup> Having spent many years in the confines of the research station in Madre de Dios, Peru, Pitman first regarded Struth's images as of nothing, or rather of little interest, as they contained no identifying markers or particular appeal from a conventional scientific—or even photographic—perspective. There were no photographs of jaguars or unique encounters with nature of the type researchers like Pitman expected and were likely to be shared at the station and amongst colleagues. Further, Pitman recalled asking Struth what he was searching for in order to help him locate it more efficiently, to which the only clear answer Struth gave was “complexity.”<sup>61</sup>

It was not until after further reflection and analysis that Pitman came to view Struth's photographs as possibly the *most* representative images of the jungle he had ever seen, not because they aimed to identify landmarks or recognizable subjects within the frame, but because they had a quality that seemed to represent the complex and interconnected *whole* greater than any single directed image might. Pitman explained that no picture could represent all that is the jungle, or the experience of being there as a matter of fact, but that an image that seems to evoke an awareness of unrepresentability can sometimes be the most faithful in its representations. As Martin Rees, a cosmologist that has published over 500 papers regarding cosmic phenomenon describes, we “can convincingly interpret measurements that reveal two black holes crashing together more than a billion light-years from Earth. Meanwhile, we've made little progress in treating the common cold, despite great leaps forward in epidemiology.”<sup>62</sup> The idea that we can think we know concepts as arcane and remote as cosmic phenomena, and be perplexed by the complexity of everyday things, isn't really as paradoxical as it seems. Reed continues: “[a]stronomy is far simpler than the biological and human sciences. Black holes, although they seem exotic to us, are among the uncomplicated

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<sup>60</sup> Nigel Pitman, “Six Pictures of Paradise - Issue 14: Mutation,” *Nautilus*, accessed March 24, 2018, <http://www.nautil.us/issue/14/mutation/six-pictures-of-paradise>.

<sup>61</sup> Ibid.

<sup>62</sup> Martin Rees, “Black Holes Are Simpler than Forests and Science Has Its Limits,” *Aeon*, December 1, 2017, accessed March 24, 2018, <https://aeon.co/ideas/black-holes-are-simpler-than-forests-and-science-has-its-limits>.



entities in nature. They can be described exactly by simple equations.”<sup>63</sup> A Peruvian forest, however, cannot be described completely in *any* manner. Meditating on the limitations of a single frame from a photographic camera—without any contextualizing markers—provides a useful insight into the limits of representation of vision and the documentary image. It also, conflictingly, highlights the capacity of singular images to become somehow *representative* of diverse and dynamic realities, such as the infinitely complex ecosystem of a Peruvian rainforest, which can then be used towards the construction of more thoughtful image relationships.

However, what does it mean that photographs are unable to describe a totality and often become symbolic representations of broader contexts, especially in documentary photography? Struth’s strategy of representing the jungle describes an approach to documentary that illuminates the impossibility of knowing precisely, and therefore must allow for an interpretive element that remains useful in the discipline. While this work departs from representations of technology, there is a thoughtful link between it and Struth’s later work at NASA in 2007 described above. Both projects signal the depths of the problem documentary photographs face in representing the overwhelmingly composite. However, even after the camera loses its ability to function directly and descriptively, it can still raise questions about loss and inadequacy within the visual field. But this strategy begins to distance itself from the ethical rubric discussed above, as it no longer suggests an aesthetic of incoherence. Struth’s *Paradise* series is somewhat conventional in its aesthetic approach and does little to upend pictorial traditions of representing landscapes or architectural interiors. The objects in the photographs visually resemble their real-world counterparts; it just so happens that these sights are difficult to digest in *any* visual manner. What are we supposed to be looking at? What sense are we to make of an artist’s intentions? And how open are they to our interpretations? What, if anything, can such images add to our understanding of complex and invisible systems if they lack the descriptive power to render them with all of their subtleties and nuances intact?

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<sup>63</sup> Ibid.

*Paradise* is a body of work that straddles a fine line between notions of ethical documentary described above and poetic documentary, which I explore here. When investigating *Paradise's* aesthetics, two distinct possibilities appear: (1) it follows an aesthetic of coherence in the many pictorial traditions it follows in capturing and presenting the landscape (general framing conventions, exotic locales, etc.), or, (2) it follows an aesthetics of incoherence in the sense that there is little represented in the images that makes traditional landscape photographs more conventionally successful and conventionally descriptive, like identifiable features and landmarks. How one reads such photographs, and which side of the debate they fall on, will likely take into account the unique relationship every viewer has toward such images and others like them. As Nigel Pitman discovered from viewing Struth's photographs over an extended period, understanding them is not as simple as it first seems, but the effort of viewing required by those not accustomed to more sophisticated documentary techniques is often rewarded by a deeper understanding of the visual conventions and problems of contemporary photography.

Poetic documentary introduces visual strategies that embrace the challenges of documenting complex and diverse phenomena. Through the introduction of aesthetic strategies that exist within a politics of incoherence, this category of documentary reigns in the potentiality of symbolism to signify the often unrepresentable. The problem of how to represent technologies that remain elusive to traditional forms of visual representation via the practice of documentary photography remains, however. Poetic documentary offers a strategy of production that has the potential to function uniquely in this domain by employing visual strategies that converse and engage with notions outside of the indexical, and that is no longer relegated to the past in the sense of documenting something that has already occurred. Regarding what technology represents in the present and its future implications, Walter Benjamin's concepts of what technology *may* accomplish are instructive here. Benjamin introduced a relation between nature and humanity at a time when technology appeared on a political knife-edge between possibilities

of a “fetish of doom” and “a key to happiness.”<sup>64</sup> According to Benjamin, the primary social function of art was (and arguably still is) to rehearse such interplays and unknowables, though, he was somewhat skeptical of the photographs ability to alone *puncture* reality, quoting Brecht here:

As Brecht says: “the situation is complicated by the fact that less than ever does the mere reflection of reality reveal anything about reality. A photograph of the Krupp works or A.E.G tells us next to nothing about these institutions. Actual reality has slipped into the functional...Something must in fact be built up, something artificial, posed.”<sup>65</sup>

Photographs singularly can offer little more than a descriptive function that can slip into what Benjamin calls “modish”-ness, or, the propensity of photographs to “transfigure” the surface world into the “beautiful.”<sup>66</sup> In this respect, Benjamin proposes the “caption” as a form of extending the meaning of the photographic document that “will rescue it from the ravages of modishness and confer upon it a revolutionary use value.”<sup>67</sup> The caption that Benjamin suggests is to be interpreted rather than taken as literal, as when he quotes Brecht’s notion of “functional transformation” (Umfunktionierung), he is referring to captions as but *one* possibility in the continuous transformation of the apparatus towards wresting its control from the hands of mass production.<sup>68</sup> Within contemporary documentary photography, this may refer to any experimental practice which distances itself from conventional and capitalist functions of the photograph. By incohering the politics of images, and particularly sequences and collections of images, poetic documents seek instead to re-open the interpretive element of photography in such a way that avoids the singular reading of photography that Benjamin rejects.

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<sup>64</sup> Walter Benjamin, “One Way Street,” in *Selected Writings, I: 1913-1926*, ed. Howard Eiland (Cambridge, MA: Harvard University Press, 1996), 487.

<sup>65</sup> Walter Benjamin, *One-way Street and Other Writings*, trans. Edmund Jephcott and Kingsly Shorter (London: Verso, 1985), 255.

<sup>66</sup> Walter Benjamin, *Understanding Brecht* (London: Verso, 1998), 94-5.

<sup>67</sup> *Ibid.*, 95.

<sup>68</sup> *Ibid.*, 93.

In reference to Heidegger's concept of nearness, the poetic photograph can potentially regard the commonplace as it is, but through alien eyes and alternative strategies that penetrate the veil of habit. It can circumspectly step back from things "in order to see them come into their elemental, world-historical presence."<sup>69</sup> When photographs cannot be reduced to the banality of representing the beauty of form, but rather inspire a curiosity of subject-relationships, an ambiguity and interpretability of meaning, and an un-readable political standpoint, they represent an opportunity towards the production of *poiēsis*, or of bringing some yet undiscovered meaning into the world. The trouble with this approach, however, often lies in the difficulty of presenting such work in a way that gives it some significance within culture.

Much of the potent effect emanating from images such as those in the *Paradise* series can be credited to the museum or gallery, as the typically unremarkable sights that Pitman refers to are often given little thought outside of a more thought-evoking context. While Struth's photographs are technically brilliant and impeccably composed, his intentions would nonetheless be in danger of being lost amongst a sea of similar images were they not given the form of special significance that the art gallery or museum can encourage. As a cultural institution that can bring forth artistic work that runs counter to aesthetic cultural norms, it can introduce concepts that are otherwise difficult to digest if not contextualized by museum/gallery texts and/or offer of a moment (and the physical space) to consider images. Galloway suggests that poetic documentary can be considered the "open-source" of the documentary field. Given time and space, a viewer can analyze *Paradise* in any number of ways—environmentalism, social commentary, or apparatic critique, for example. One thing a viewer could not do, however, is claim that their reading is entirely or unconditionally the most valid interpretation, at any one particular moment in time.

Using a different, but related, approach, the photographic artist Robert Burley began documenting the decline of traditional photography in 2005. The

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<sup>69</sup> Martin Heidegger, *On Being and Time*, trans. John Macquarrie (New York: Harper and Row, 1962), 139.

project, *The Disappearance of Darkness*, took Burley across Canada, Europe, and the United States in search of signs of this demise in the form of facility closures and factory demolitions. Factories that had been in operation since the beginning of the mass production of film were closing at an alarming rate. Photographic film was becoming redundant, its function usurped by the efficiency and popularity of the digital sensor. Burley offers a reading of this moment:

The act of dissolving blocks of silver into nitric acid, mixing it with the tissue of animals and coating it onto film and paper—all so the world could partake in one of the world's most fascinating and important inventions—was coming to a rapid halt.<sup>70</sup>

Photographic film as we know it has been around for over 150 years, but its near disappearance has taken a fraction of this time. Burley's fascination with this demise was spurred by his reliance on these traditional materials over his photographic career, and inevitable questions regarding what would happen next. Within his body of work, we find images of demolition, abandoned buildings, and stripped interiors. *Implosions of Buildings 65 and 69, Kodak Park, Rochester, New York [#2]* (2007) remains perhaps the most iconic of them all [Plate 13]. For this photograph, Burley directed his camera at the cameras of the media there to capture the last moments of the historic Kodak building. The photograph is lit by an eerie glow, as dust and debris make taking any kind of photograph of the building's implosion impossible. In its final moments, the Kodak building escaped any form of representation; its debris created a great blinding veil that illuminated a moment of transition and unknowability.<sup>71</sup>

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<sup>70</sup> Robert Burley, "Disappearance of Darkness Book Preview," 2012, video, accessed March 25, 2018, <https://vimeo.com/35389773>.

<sup>71</sup> Burley's photo-book is arguably not the best way to experience the photographs as it acts as a didactic container that simplifies many of the work's strongest elements. Viewing on the gallery wall, with less contextualizing text, instead, leaves the viewer with a space for more curious contemplation.



Plate 13 - Robert Burley, *Implosions of Buildings 65 and 69, Kodak Park, Rochester, New York [#2], October 6, 2007* sizes variable, 2007. From the series *The Disappearance of Darkness*, first exhibited at the Canadian Centre for Architecture, Montreal in 2009. Courtesy of Stephen Bulger Gallery.

This collection of images offers a deep metaphorical understanding of the subject of technological transition that distances itself from simple documentation. The act of photographing spaces that had, for decades, not seen the light of day provides an apt metaphor for the blindness and momentary flashes of illumination that accompanies rapid technological change. In a sense, these are photographs of the past; however, they exist more cogently as documents that raise questions about the future. The viewer can enjoy them only as depictions of a bygone era, but the series also induces reflection on the camera as a tool of representation undergoing a radical, yet highly invisible shift. Real spaces, soon to be invisible in any tangible sense, become iconic for their representation of the constant shifting and unending cycle of technological ordering. In another photograph in the series, *Darkroom, Building 3, Kodak Canada* (2009), Burley shows factory curtains pulled apart to reveal a black wall inscribed with the text “WATCH OUT” and an illuminated

corridor [Plate 14]. As viewers, we may interpret it as we see fit: one might consider Burley's motivations to document an ongoing shift in imaging technology, one that he had himself had witnessed; another might equally reasonably consider the project an artist-directed meditation on the ramifications of such a disruption both individually and within a culture that is witnessing a shift in representational modes.



**Plate 14 - Robert Burley, *Darkroom*, Building 3, Kodak Canada, Toronto, sizes variable, 2006. From the series *The Disappearance of Darkness*, first exhibited at the Canadian Centre for Architecture, Montreal in 2009. Courtesy of Stephen Bulger Gallery.**

Such an image comes as close as possible to visualizing both Crary and Virilio's concerns discussed in the previous chapter. As a picture, it tempts us to question what accidents and obstacles, and also what confusions, might lie ahead, shrouded in darkness and just beginning to come to light. These types of relationships between conceptual gestures and images that force the questioning of the future, function in a way that pushes the documentary photograph into investigative and contemplative territories. While the images above could be enjoyed just for the beauty of the forms they reveal via an exploration of soon-to-be-demolished architecture, there are many other layers to discover, crafted by an artist that elicits deep connections between artistic gesture, aesthetic relationships and metaphorical representational techniques.

In a final example, Mitch Epstein's poetic documentary projects likewise upend more conventional and purely physical representations of technology within our social landscape. Epstein focuses on both physical and emblematic manifestations of power in contemporary society. The body of work titled *American Power* (2003-2008) contains photographs depicting the American landscape infiltrated by megastructures that seemingly define the landscapes in which they reside. He creates images of relatively small American cities that harbour giant nuclear facilities, oil refineries, factories, and pipelines, along with the sprawling infrastructure that ensures their viability [Plate 15]. The scale of the subject matter, and of his printed photographs, mirrors the massive scope of issues that he attempts to address in the gallery and beyond. Technology is presented as large and abrasive, hiding in plain sight (viewable often by special access only), and looming over history. Epstein asks: 'What is American power?' answering the question through images that sometimes directly address our reliance on technologies of power, but *also* indirectly imaging social power relations and the broad reliance on technology to maintain political positions.

Like in *The Disappearance of Darkness*, personal biography certainly adds contextual layers within Epstein's work. Whereby Burley describes the transition of the medium of photography as influencing the capture of his subjects, Epstein describes the resistance he encountered with law enforcement during the documentation of such structures, even when well within his legal rights to photograph his subject: "For me, what was really out of whack was corporate security for power plants that would use law enforcement to inhibit or prohibit photography. I'd be kind of vigilante-style led out of a town or told I had to go or I was going to get arrested."<sup>72</sup> Such external contexts add to the construction of meaning within the photographs, as viewers might become aware of the surprising infringement on the fundamental human right of looking, from a public vantage point, the infrastructure of so-called public utilities.

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<sup>72</sup> Paul Schmeltzer, "Visualizing American Power," *Walker Art Center*, October 16, 2013, accessed March 24, 2018, <https://walkerart.org/magazine/mitch-epstein-paul-shambroom-american-power>.





**Plate 15 - Mitch Epstein, *Amos Coal Power Plant, Raymond City, West Virginia*, 70 x 92 inches, 2004. From the series *American Power* (2003-2008).**

Epstein's photographs are not limited to a general understanding of the forms contained within each one, but also rely on the subtlety of the sequential essay form to explore at a depth difficult to achieve in a single image. Nowhere in these works does one find, as Michael Truscello states, "an image that intimates a possible return to some form of pristine natural world; instead, viewers must confront the toxic future of [...] the hyper objects of postmodernity" that have already erupted and can thus begin considering their moral and political undertones.<sup>73</sup> The images together function by creating Enframing devices and compositional relations for the viewer that are unlikely to be made without the unlikely pairing of images and visible phenomena, which at first glance have no

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<sup>73</sup> Michael Truscello, "The New Topographics, Dark Ecology, and the Energy Infrastructure of Nations: Considering Agency in the Photographs of Edward Burtynsky and Mitch Epstein from a Post-Anarchist Perspective," *Imaginations: Journal of Cross-Cultural Image Studies (ARCHIVES)* 3, no. 2 (2016): 188.

direct or conventional relation. For example, in *Poca High School and Amos Coal Power Plant, West Virginia* (2004), a coal power plant spewing generous amounts of pollution is foregrounded by a practicing high school football squad, which is later contrasted by a photograph of a heavily armed guard stationed within a nuclear facility in *Grand Gulf Nuclear Power Plant, Mississippi* (2006), and later again juxtaposed with a meticulously groomed truck parts store in *Iowa 80 Truckstop, Walcott, Iowa* (2008). In this way, Epstein's work is not very different from Burley's. Both function symbolically so their meanings are ultimately interpretable by the viewer. However, Epstein also inserts these images into various public spaces without direct capital gain, furthering the relationship between actual spaces and the landscapes which he photographs. Photography's function can reify the impact that such photography can have today in a culture that is increasingly bombarded by images within an artistic framework—one that eschews popular cultural forms—allowing opportunities for more profound reflection through exposure not only via the gallery or museum, but also custom made web applications, and other (typically) unusual manners of public display [Plate 16].

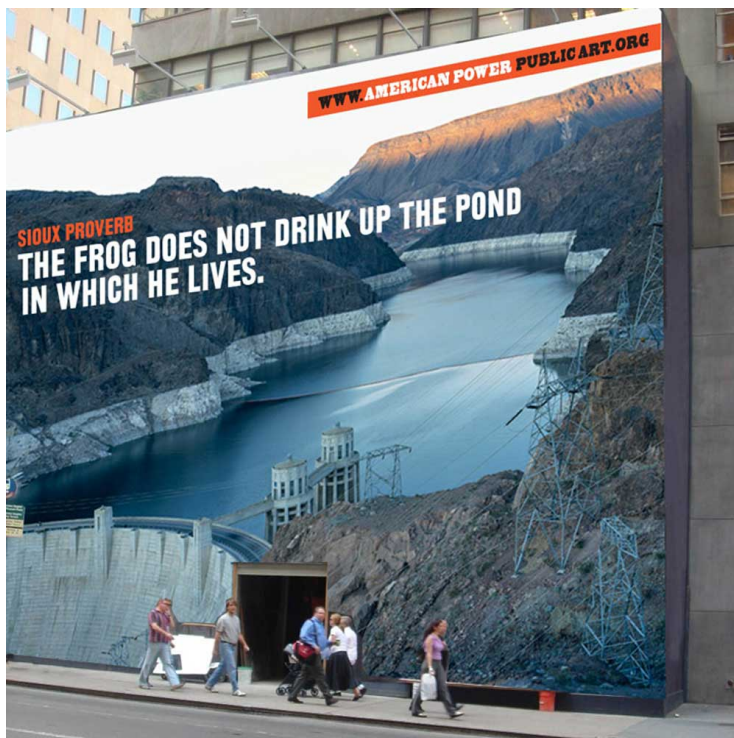


Plate 16 - American Power Public Art billboard proposal. Courtesy of Black River Productions, Ltd. & Anthony McCall.

## 2.5 TRUTH AND RADICAL DOCUMENTARY

When two images fall next to each other within the spectrum of vision, a significant meaning may emerge or no meaning at all. This, of course, depends on which eyes make the connection throughout space and time. This last regime, which Galloway precariously labels “truth,” and I will refer to as *radical documentary*, considers forms of representation that consist of both an aesthetic and political incoherence. Such forms are rightfully tricky to identify because they constitute the everyday experiences of all image consumers as they attempt to make sense of their visual surroundings. Where image production through various networks of visual exchange consists of multiple and plentiful attempts to curate visual messages, radical documentary might best be described as the infinite and varied configurations of viewed images within the complexities of everyday life, where they are rarely meant to be viewed together at all.

While the above definition may seem unnecessarily abstract, it does describe our daily condition of visibility and our uncanny ability to create meaning under diverse circumstances. In this way, radical documentary is a category that functions quite differently from the ethical, ideological, and poetic regimes discussed above. In those regimes, the motive behind the image, whether aesthetic or political, is relatively simple to identify, as is its grounding in cultural production. Therefore, it is possible to identify the utility and shortcomings of attempts at visual representation. For example, Lewis Hine was compelled by humanitarian desires, Robert Frank by political discourse, and Struth by more philosophic pursuits. Representing Galloway’s truth, however, holds no similar utility. The concept is both personal and interminable, and by its very nature, can come to no foreseeable dénouement due to our progressive social and cultural understandings of objectivity and relativity. As discussed in the previous chapter, the philosophy of science has progressively appealed for a greater diversity of understanding via feminist and social constructivist theories that expand, rather than limit, our possibility of understanding our subjects. As such, an appropriate category such as radical documentary can be conceptualized as one that endorses an expansion and constant



challenging of the field with no particularly fixed motives. As such, the deconstruction of the Interface and the philosophy of science can help to illuminate the potentialities of thinking through this tricky regime.

What is an aesthetically and politically incoherent image? Paul Feyerband is instructive here in that he identifies a similar category within science for its utility in rooting out implausibility, odd connections, randomness, and even chaos with the aim of promoting a more subjective approach that is necessary towards any reformative progress.<sup>74</sup> Feyerband, for example, criticizes the “rationale” behind scientific inquiry and encourages us to consider notions of objectivity as a possible, rather than the only, way forward.<sup>75</sup> Seeking out alternatives truly represents an opportunity, with few guarantees, to create something novel. Visually, this can mean the introduction of a new way of understanding both our ocular and invisible worlds. Conceptually, it suggests that we meditate on the potentialities of shifting a rigid and conformist way of understanding and applying tools that are already within our grasp. It is fair to ask how we might achieve a structuring of what is inherently un-structurable, but also to consider that it naturally cannot happen if we do not experiment with our visual forms. As Feyerband notes, all (scientific) revolutions have come from making connections that were once thought neither worthwhile nor useful.<sup>76</sup> As it stands, traditional photographic documentation is inadequate for describing the world wholly—as it will always be—but there is room for improving our methods, which will in all likelihood endure. As Heidegger suggests, the camera as a tool has taken such a hold that it is difficult to envision our culture without it, so it is necessary to wield it radically in order to adapt and improve its functional use.

Of course, there is no one way of wielding the camera as such. If pluralism matters, if standpoint matters, if equality and fairness matter, it is reasonable to expect as much of our photographs and our representational practices. What can be revealed as a fact depends on the notion that a category of absolute facticity does not

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<sup>74</sup> Paul K. Feyerabend, *Against Method* (London: Verso, 2010), 156.

<sup>75</sup> *Ibid.*, 61.

<sup>76</sup> Paul K. Feyerband, *Knowledge, Science and Relativism*, 205-6.

exist, but rather that there are many veracities and many ways of attaining them. Notions of facticity and objectivity lie at the root of most documentary productions, though, a thorough analysis of the field would reveal that a genuinely impartial representation is utterly impossible. Thus, even defining the term *documentary* is a particularly tricky endeavour. While attempting to do so is not the goal of this section, it is worthwhile to examine a few perspectives that contextualize documentary's practice as a method towards representing our evolving contemporary landscape.

Regarding documentary's utility for solving the problem of the facticity of representation, Howard Baker argues that visual sociology, documentary photography, and photojournalism are social constructions whose meanings arise from the contexts—organizational and historical—of different worlds of photographic work.<sup>77</sup> He persuasively argues that re-reading photographs made in one genre as though they had been made in another illustrates the contextuality of meaning. For example, a Pulitzer Prize-winning photograph such as *The Vulture and the Little Girl* (1993), which depicts a weak and malnourished child being circled by a vulture, might be received with both horror and praise. The suicide of its author, Keith Carter, has been attributed, at least in part, to this complicated reception. Carter's supposed internal struggle with how images are received and perceived, but also in how they are created and disseminated, raises important questions regarding the place of facticity in documentary. While Carter represented reality as he had witnessed it, his choices of framing and dissemination offer a particular reading of the image. On the cover of the *New York Times*, the photo appeared as a fact-like account of conditions in Sudan at the time. Displayed in the adverts of humanitarian aid agencies, it represented an opportunity to accrue donations for the betterment of those starving everywhere. At an awards gala, it might be celebrated as a work of pictorial genius. The image itself, however, might have been created, without anyone ever knowing, by goading a vulture nearer to the child with food, or perhaps was constructed under circumstances that are difficult to imagine altogether. This

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<sup>77</sup> Howard S. Becker, "Visual Sociology, Documentary Photography, and Photojournalism: It's (almost) all a Matter of Context," *Visual Studies* 10, no. 1-2 (1995): 5-14.

conundrum remains the trap of photography that unceasingly vexes the viewer, even those sophisticated enough to be fully aware of the role that context and interface play in documentary images. Reality often *is* stranger than fiction, so expecting viewers to understand what is left out of a photographic frame becomes a near impossibility.

Trinh Minh-Ha tackles the notion of facticity in documentary production as representative of a history of dominance in depictions of various positions of power in society, arguing that “meaning should be prevented from coming to closure at either what is said or what is shown...[w]hat is put forth as truth is often nothing more than *a* meaning.”<sup>78</sup> Carl Plantinga tackles documentary from a similar perspective, convincingly relaying the notion that documentary “intends that the audience come to form certain beliefs [and] implicitly assert something about the use of the medium itself.”<sup>79</sup> He refers to documentary production as offering an “audiovisual array” that communicates some phenomenological aspect of the subject, from which the spectator might reasonably be expected to form a sense of that phenomenology, and/or form beliefs about the subject that is being put forth.<sup>80</sup> In this regard, we can imagine a purpose that is similar to *poiēsis*, but which also has the potential to shatter our sense of aesthetic certainty. In photography, creative applications of the camera might put forth a special meaning, in that such documents can share new knowledge of the world, but also question that knowledge (or lack thereof) with veracity. This is where photography has always had utility, and, as I will argue, will become even more useful still.

In this final section, I expand on the notion that documentary—apart from a desire to relay phenomenological aspects (or some sense of direct experience) upon its viewer—inherently asserts a difficult-to-describe *something* about the culture it exists in and the media that it is relayed upon. If one were asked to imagine a complex term such as the Internet, a likely visual stereotype of server rooms or

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<sup>78</sup> Trinh T. Minh-Ha, “Documentary Is/Not a Name” *October* 52 (1990): 76.

<sup>79</sup> Carl Plantinga, “What a Documentary Is, After All,” *The Journal of Aesthetics and Art Criticism* 63, no. 2 (2005): 112.

<sup>80</sup> *Ibid.*, 112.

wires might come to mind; however, such visual representations are unquestionably poor illustrations of the phenomenon in question. Other images must be constructed in order to combat the clichéd and under-representative, images that call into question the utility of visuality within contemporary culture. Such images stray from our standard conception of documentary practice, yet do not stray far, as they are grounded in familiar tools and methodologies, and expand on them in critical ways.

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I begin by examining the concept of Near Documentary introduced by Canadian artist Jeff Wall. It presents a useful framework for understanding how documentary images can bisect notions of reality and illusion, a somewhat necessary precondition for understanding how images address issues not contained directly within their photographic frames. I will then explore Lynne Cohen's documentation of various social yet empty and seemingly unrelated human spaces. The works of Andreas Gursky and Dornith Doherty will also be mined for strategies that move beyond conventional documentary methodologies yet remain firmly fixed in the genre. Finally, Joan Fontcuberta's various works of science fiction will be explored to understand how far the term documentary can be stretched before it collapses in on itself. The motivation behind this analysis lies in revealing the integral capacity of the artist's camera to produce insights greater than a latent indexical relationship with its subject, mainly when the artist uses it reflexively in the documentary mode.

A much-discussed early work by Jeff Wall about the camera and its potentials entitled *Picture for Women* (1979) reveals the effectiveness of Near Documentary as an approach that can question and be wholly constructed, yet remain grounded firmly, in the real. Such a work reveals the power of photography to demonstrate the complexity of a seemingly simple and reductive technological instrument such as the camera. Much of Wall's artistic practice has consisted of reimagining realities, where the artist reconstructs daily encounters with the world photographically. Wall uses the term neo-realism to describe this approach:

I prepare certain things carefully because I believe that's what's required. Other things are completely left to chance. Anything that is prepared, constructed, or organized is done in order to allow the unpredictable "something" to appear and, in appearing, to create the real beauty of the picture, any picture [...] I use the term "neo-realism" in the sense the Italian filmmakers of the 1940s and after used it. It refers to using non-professional performers in roles very close to their own lives, photographing events as if you were doing reportage, and recognizing good subjects in the everyday.<sup>81</sup>

The idea of using non-professional performers, chance, and unpredictability aligns with notions that Wall references in his practice, and distinguishes his work from a more rigid documentary mode of production. While his meticulously crafted images may be more constructed than other types of documentary photographs, the point at which a photographic image crosses into pure fiction and construction is difficult to identify and remains an intriguing issue in and of itself. This question will be explored further below. The way photographs share an indexical relationship to their subjects is an essential element of their representational prowess. In *Picture for Women*, Wall presents us with an up-to-date response to Manet's 1882 painting *Un bar aux Folies Bergère*, exchanging the male gaze for that of the camera within a more contemporary context:

In Manet's painting, a barmaid gazes out of frame, observed by a shadowy male figure. The whole scene appears to be reflected in the mirror behind the bar, creating a complex web of viewpoints. Wall borrows the internal structure of the painting, and motifs such as the light bulbs that give it spatial depth. The figures are similarly reflected in a mirror, and the woman has the absorbed gaze and posture of Manet's barmaid, while the man is the artist himself. Though issues of the male gaze, particularly the power relationship between male artist and female model, and the viewer's role as onlooker, are implicit in Manet's painting, Wall updates the theme by positioning the camera at the centre of the work, so that it captures

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<sup>81</sup> Jan Estep, "Picture Making Meaning: An Interview with Jeff Wall," *Bridge Online 2* (2003), web, accessed March 24, 2018, <http://www.janestep.com/wp-content/uploads/2012/06/2003%20Estep%20Wall%20Interview.pdf>.



the act of making the image (the scene reflected in the mirror) and, at the same time, looks straight out at us.<sup>82</sup>

An image such as this raises many questions about our understanding of documentary photographs, their primary motivations as expressive works of art, and their successes in broadening rather than limiting our understanding of the camera. This image, along with Wall's expansive oeuvre over his substantial career, have done much to develop dialogue around the capacities of the camera and photograph, as demonstrated by the way his work shattered many conventions in the 1970s and 1980s. Wall essentially merged the conceptual trends occurring during his early years as an artist with the medium of photography, and as a result, his work questioned the materials and technology of the photograph as much as it referenced historical modes of practice. *Picture for Women* is perhaps his most explicit work in this regard; however, the subject of the camera as a multifaceted technology exists throughout many of his works.

Wall's near-documentary or neo-realism offers a way to understand the capacity of documentary to depart from the more easily defined (and contained) forms discussed above. Tearing the document from the contexts and narratives that give it its authoritative and explicit meaning, while also disturbing an aesthetic of coherence, produces images that disrupt the photograph's authority, and evoke highly interpretable and intimate questions. *Picture for Women* presents a complex image that shows the camera as its subject, thus expanding our relationship with the camera by referencing its complicated status in modes of representation. The work also complicates a more straightforward rendering of the technology as holding an indexical relationship to the world. If we were to demarcate Wall's mode of documentary, we would say that it is not motivated by defining or limiting the readings of a photograph, but that it opens up the image to indeterminate meanings, interpretations, and questions. When the intentions of a documentary image are not

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<sup>82</sup> Gallery Guide text for the exhibition *Jeff Wall Photographs, 1978–2004*, Tate Modern, London, 21 October 2005 to 8 January 2006, quoted in David Campany, "'A Theoretical Diagram in an Empty Classroom': Jeff Wall's *Picture for Women*," *Oxford Art Journal* 20, no. 1 (2007): 12–14.

fixed, and its materiality and construction are also examined, the photograph is seen to function entirely independent of such conventional modes.

One of the most engaging artists to use a related form of documentary, especially in technological representations, is the American-Canadian artist Lynne Cohen (1944-2014). Cohen's practice involved photographing human-less spaces filled with the remnants of often-indecipherable technologies. Her images depict humanity through representations of interior spaces and collected objects, rather than human occupation, and evoke a sense of human presence through this absence. Paul Butler, discussing a survey exhibition of Cohen's work at the Winnipeg Art Gallery with Peter Zinojic explains:

The photographs are almost portraits of the people who arranged these spaces, but without the person. They look staged, like movie sets.... For me, her work has that extra element you can't really put your finger on. It's like a battle between the two sides of your brain, where you look at it and say: 'well it's just a photo of a space,' but it's not, there's more to it. And that's what's interesting, what her work draws out of the viewer, what it triggers, the places it brings them to.<sup>83</sup>

Further, a lack of descriptive titles or text forces viewers to consider images that have been torn from their historical and contextual surroundings before coming to any definitive conclusions about them. Cohen's photographs take the real as a starting point—they show real places that exist within the world—and allow for the imagined, constructed, and documentary aspects of the image to collide. Stripped of the narrative conventions that many documentary works rely on, her photographs have no beginning or end, nor proper order.<sup>84</sup> They simply inspire a questioning of what the spaces, objects, and technologies within the images might be for, and

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<sup>83</sup> Peter Zimonjic, "Found Places: The Photography of Lynn Cohen," *National Gallery of Canada*, April 11, 2014, accessed March 24, 2018. <https://www.gallery.ca/magazine/exhibitions/found-places-the-photography-of-lynn-cohen>.

<sup>84</sup> Cohen discusses the narratives of her work by referring to individual photographs as: "pieces of a narrative puzzle that could be about anything. It's totally absurd. Absurd, but it does tell a story. So the work goes back and forth; it is narrative and it isn't." See: Bryne McLaughlin, "Lynne Cohen: Space Invader," *Canadian Art*, June 2, 2011, accessed March 25, 2018, [https://canadianart.ca/features/lynn\\_cohen/](https://canadianart.ca/features/lynn_cohen/).

compel viewers to produce meaning via their relationships with the depicted forms. In an interview with Bryne McLaughlin of Canadian Art, Cohen expands upon her practice:

In fact my images are mostly found. I don't do any staging. But if you set one picture against another, it can register a totally different temperature. I love that. I talk about pictures contaminating each other. I love the idea of infiltration and contamination in the way that you end up somewhere that you never intended to be. And who would have known anyway?<sup>85</sup>

The framing techniques used to capture Cohen's subjects, and the unlikely relationships produced through their combination, purposely confuse them. The details left both inside and outside the frame defy normal documentary convention (or the desire to present a complete picture of a subject), and rather emphasize a peculiarity that is often hidden in our ordinary experience of inside spaces. Further, through the careful composition of the objects she renders within the frame, Cohen attempts to make the viewer "physically unstable," to "affect him or her psychologically as well."<sup>86</sup> Finally, we cannot *know for certain*, as viewers, whether the artist has constructed the scenes or tampered with them in any way, even after being told by the artist that she has not. This uncanny ambiguity produces a reading that requires interpretation and contemplation, leaving no space for assurances or consummations.

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<sup>85</sup> Ibid.

<sup>86</sup> Ibid.



Plate 17 – Lynne  
Cohen, *Spa*, 110 x 129  
cm., 1993-1994.



Plate 18 - Lynne Cohen, *Laboratory*, 140 x 171 cm., 2005.

Cohen's visual investigations allow for a more profound reflection of sites and spaces that we have grown accustomed to, or perhaps that reside firmly implanted in our imaginations due to repeated representations in visual culture. As *Near Documentary*, Cohen's approach functions differently to Wall's. There are no actors or staged sets, but rather the images are presented in series where the traditional links that compose a photographic series are uprooted. For example, many of her photographs have titles like *laboratory* and *spa*, but after extended looking, the objects and forms in each set of two images easily blur into one [Plates 17 and 18]. This effect not only leads to the natural question of what a laboratory or spa is *supposed* to look like but also underscores the bizarre similarities and relationships that two supposedly disparate spaces share. It is not that Cohen upends any pictorial notions so much so that her images are inherently confusing, but that the associations formed when viewing a collection of her work produce a

host of unforeseen relationships. In this way, it is useful to consider Cohen's approach as near to documentary traditions, but novel in its blatant visual intervention and omission. It is fair to consider, given the lack of context, that Cohen's motivations were at least in part to offer a broadening rather than a limiting of our collective definitions of common spaces such as laboratories and spas, and how they are *assumed* to look. The artist's sparse use of descriptive titling and an unwillingness to locate specific spaces often means that several photographs either have the same title or go untitled, thus furthering the notion that Cohen desires to mystify our visual field.

Moving slightly away from Near Documentary, another distinct example of a novel approach towards documentary practice exists within the digitally manipulated work of Andreas Gursky, where the potentials of digital imaging technology are referenced in tandem with a variety of techno-globalized subject matter. Caitlin Zaloom describes one of Gursky's iconic images of a stock market trading floor:

A photograph of the Chicago Board of Trade hangs in a crowded, central passageway of London's Tate Modern gallery. Every inch of its six-foot length vibrates with financial frenzy and spins with the disorder of time and space. The picture induces the vertigo of the contemporary world, and the frame spills over with traders, clerks, brokers, computer terminals, and telephones. The acid colors of trading coats whirl in and around the dealing pits. Hands and faces blur as they work to buy and sell financial commodities. The motion is not all in the present, though. Andreas Gursky, the artist, digitally layered the image to show traders who were once there and have now gone. Trading cards, bits of newspaper, and financial statements shine through spectral bodies. The camera can record only their traces as they hurtle headlong into the future. Just as past, present and future blur together, space is also unstable. The trading area collapses inward as the plane of the floor tilts forward into the frame. The composition lacks a distinct center. The viewer is off balance—neither directly nor hanging above it.<sup>87</sup>

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<sup>87</sup> Caitlin Zaloom, *Out of the Pits: Traders and Technology from Chicago to London* (Chicago: University of Chicago Press, 2006), 1.

This analysis of Gursky's photograph, *Chicago Board of Trade I* [Plate 18], summarizes the complexity of the photographer's intentions and approach, appropriately describing the image as representative of the symbolic immensity of the subject it attempts to represent, along with binding the timelessness associated with financial transaction to a visual strategy. Grounded in a documentary visuality, the image that at first might appear to viewers as single and still requires further investigation before viewers might notice the discrepancies and visual cues to the manipulations of the frame. Combining perspectives, using multiple photographs, and colour manipulation are just a few of the digital tools that Gursky uses to construct photographs that might best be described as "larger-than-life", or as images that attempt to represent at a scale *beyond* the capacity of the still image camera. That Gursky's images still look like photographs—at least at first glance—indicates the malleability of the contemporary camera as a tool capable of producing hybrid images that defy simple categorization.

Why did Gursky feel the need to digitally construct these photographic collages when the stock market trading floor already contains hectic and photogenic subject matter? Answering this question requires reflecting on the limits of traditional documentary photography techniques, and what might be gained by introducing new ways of fabricating photographs. While it undoubtedly was possible to create photographic montages prior to digital technology, the speed and accuracy of contemporary digital imaging processes have made the practice incredibly more robust. The introduction of Photoshop, for example, as Lev Manovich describes in the previous chapter, introduced new possibilities and new tools for photographers to manipulate their images. The notion that conventional photographic techniques could not achieve the sense of scale that Gursky was after in his image is a fair one to consider. Through contemporary and evolving tools the photographer found a strategy for reflecting a reality beyond what the camera alone could capture. Gursky is not representing a *physical* space after all, at least not entirely, as the stock market trading floor is but one cog in the vast machine of global finance.





Plate 19 – Artist Unknown, *The Field of the Cloth of Gold*, oil painting, circa 1545.

Much like the other artists discussed in this multifaceted category of documentary production, Gursky does not stray far from aesthetic conventions within an artistic sense. The scale, detail, and compositional awareness (along with perspective impossibilities) of his images all harken to a renditioning common in sixteenth-century painting, where perspective was not yet fixed to the lens' way of perceiving the world [Plate 19]. However, the use of the photographic camera to construct such compositions points to an abstractedness that embraces the fragility of realistic representation and brings forth an awareness of the apparatus *through* its abstraction. The aesthetic incoherence in his work is entirely grounded within the consideration of this art object as a straight photograph because at first glance, it seems very much like it could be. In Gursky's photography, we often find only symbolic references to the real as it may have existed in front of the camera, when a more extended viewing reveals the concise manipulative effect of the apparatus itself [Plate 20]. The simple camera object is exposed as a tool, augmented via digital technologies, which has as much ability to reconstruct reality as it does to efficiently re-represent it. In the case of *The Chicago Board of Trade*, Gursky constructs a hyper-moment that exists outside of real-time, one that effectively grapples with the inherent scale of such a monument of capitalism, while also considering the gargantuan effect that the real world of global commerce has on our daily lives.



Given that global trade and commerce exist digitally and are no longer bound by physical space, it is only fitting for artists to develop strategies that both mimic and contemplate such realities.



Plate 20 - Andreas Gursky, *Chicago Board of Trade I*, 73 x 95 ¼ inches, 1997.

The politics of such an image are indeed incoherent; we struggle to find a fixed meaning or motivation behind Gursky's work. We can consider his artworks as contemplative rather than grounded; questioning rather than determinate. A stock market trader may view Gursky's image as a celebration of free markets and commerce, while another viewer altogether might question the absurdity of the scene and all the injustice and profiteering it might represent. The image's success, however, is not determined by individual readings, but rather by its ability to make viewers reconsider what it is that they are looking at, with many representational groundings so unsure. This approach should not assume that such digitally manipulated documents are not documentary, but rather that digital manipulations

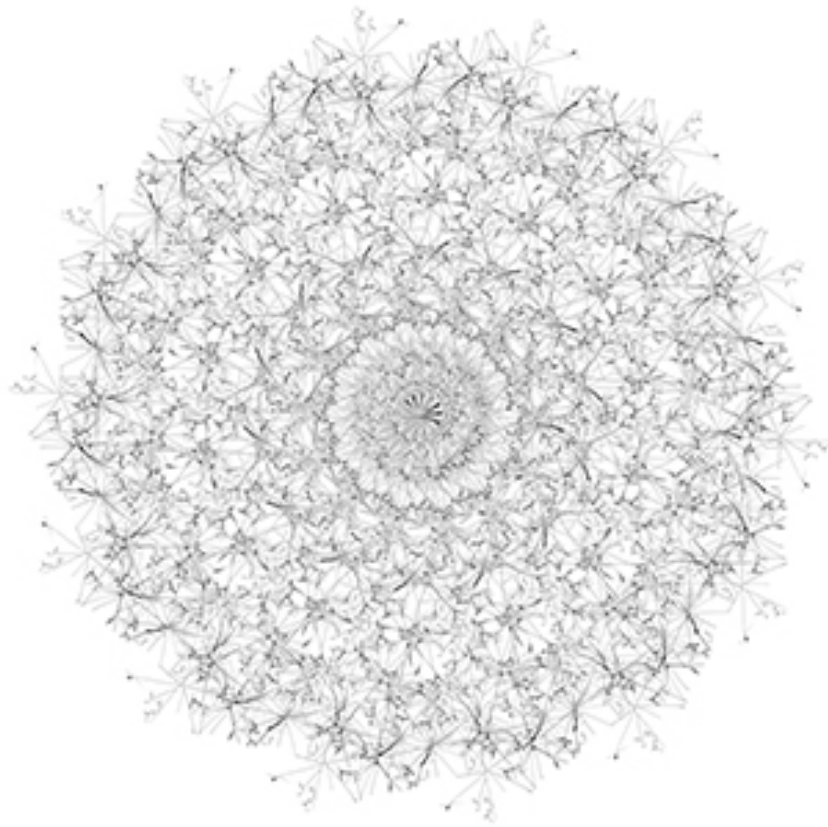
are fitting for the camera, a technological tool that can somewhat encompass the strange new reality of hybrid technology and hidden affect. Since a trading floor can be represented in many ways, it is the images that can bring forth new perspectives and new strategies that become useful when reflecting upon a more feminist approach towards increasing, rather than limiting, the diversity of representational approaches.

Dornith Dorthy is another artist who uses the camera uniquely in a documentary capacity, producing large-scale photographs that could easily be mistaken for images produced in scientific study. For example, in *Archiving Eden* (2008-present), Dorthy photographs and experiments with magnified images of seeds. Many of her photographs contain references to macro-scientific imagery [Plate 21]. By presenting her work under an artistic rubric, however, she constructs knowledge in a much different way than a laboratory scientist does. Here, seeds become valued for their aesthetic character and arrangement, producing new sets of knowledge, awareness, and understanding that the public is not likely to be privy to. Dorthy's images resemble Karl Blossfeldt's archive of close-up photographs of plants and living things, used not only as teaching tools in the sciences, but also hailed for their artistic merit within the circles of New Objectivity and Surrealism.<sup>88</sup> While Dorthy's aesthetic may not differ much from Blossfeldt's, the patterns she constructs renew a sense of wonder that might be lost in more scientific presentations and provide the only real way we get to see these seeds outside of science textbooks. Her choice of seeds rather than other natural wonders references a particular awareness of contemporary environmental issues; however, the work is not explicit in its message. *Archiving Eden* may impart an environmentalist stance when considered in contemporary theoretical discourse, such as that of the Anthropocene. However the message is not *in* the images, and the images are not necessarily burdened by a message. The artist has produced merely a symbolic gesture that will hopefully expand our understanding of a complex organism with a complex structure, history,

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<sup>88</sup> Hanako Murata, "Material Forms in Nature: The Photographs of Karl Blossfeldt," in *Object: Photo. Modern Photographs: The Thomas Waither Collection, 1909-1949. An Online Project of the Museum of Modern Art* (New York: MoMA, 2014).

and future. Like Gursky, Dorthy employs digital technologies and the camera apparatus to reconstruct and reveal the invisible to the eye, offering a novel visual knowledge that would be difficult to construct otherwise.



**Plate 21 - Dornith Dorthy, *Untitled*, 56 x 56 inches, 2015. Digital Collage made from x-rays captured at PlantBank, Threatened Flora Seed Centre, and Kings Park Botanic Gardens (Australia).**

Joan Fontcuberta provides a fitting conclusion to this section, directing us to the vexing question of how far the documentary image can be pushed before falling into pure abstraction. Fontcuberta's practice has long consisted of producing images that relish in the malleability of photographic realities. Since 1984, his work has consistently challenged the facticity of photographic representation, relying on

collage and digital manipulation to raise new questions about the camera as a representational technology. Apart from an inherent questioning of the camera as a technological tool, Fontcuberta has also tackled scientific objectivity, dissecting the realities that are constructed by an institution so reliant on technological representation. For example, Ken Johnson of the *New York Times* describes the series titled *Constellations* (1993): "images of the cosmos are strewn with a fine stardust, [but] what they actually record is dust, crushed insects and other debris that accumulated on the windshield of Mr. Fontcuberta's car."<sup>89</sup> The photographs in this series were created "by applying sheets of 8-by-10-inch film directly to the glass and shining a light through, creating photograms, which were then made into Cibachrome prints."<sup>90</sup> Despite their humble origins, Fontcuberta's images indeed resemble early satellite photographs of distant galaxies, and therefore question how much we can understand about the cosmos via the examination of photographic images (as its representational qualities are limited and sometimes misleading), and perhaps vice-versa. The work, perhaps, accomplishes enough if it introduces such thoughts to the viewer, confusing preconceived assumptions. In other works such as *Sputnik* (1996), Fontcuberta fabricates narratives and blends photographic facts of Russian space voyages with constructed fictions. In *Orogenesis* (2009) he produces landscape images via TerraGen, an application produced for military and scientific purposes that turn maps into images of three-dimensional terrain. However, instead of maps, Fontcuberta inserted modernist landscape paintings and photographs into the TerraGen algorithm, constructing a landscape out of human culture, thus suggesting that even "scientific" images are influenced by human culture and human understanding.<sup>91</sup> Along with *Googlegrams* (2005), the *Orogenesis* series has been said to "call into question the boundaries of representation in the information age."<sup>92</sup>

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<sup>89</sup> Ken Johnson, "Joan Fontcuberta 'Constellations.'" *The New York Times*, January 30, 1998, accessed March 24, 2018, <http://www.nytimes.com/1998/01/30/arts/art-in-review-335924.html>.

<sup>90</sup> Ibid.

<sup>91</sup> Philip Ball, "Changing Your World View," *Nature* 438, no. 7070 (2005): 915.

<sup>92</sup> Eric Bryant, "The Indecisive Image," *ARTnews*, March 1, 2008, accessed March 24, 2018, <http://www.artnews.com/2008/03/01/the-indecisive-image/>.

Fontcuberta's work can best be described as lying on the prospective boundary of documentary representation and fiction. Through his use of film stock, photography, the camera, and other scientific tools of representation, he effectively calls into question the representational capacity of our current technologies, and asks us to rethink our connections to the visual world. Such a practice remains effective because of its ties to the documentary medium and the relationship it has historically had with faithful representation. However, with invisible and non-visual cultural phenomena, the problems of representation grow more confounding. How might we begin to represent the invisible forces constructing our reality? Fontcuberta's strategy has been to point out the impossibility of truly knowing, and to offer an inquisitive stance instead.

## 2.6 CONCLUSION

Much like Galloway has suggested, the notion of truth as defined by the dual characteristics of aesthetic and political incoherence is likely impossible to represent wholly by any single means. He asks us to consider the following while asking if some things are genuinely unrepresentable:

Each photograph of violence is a testament to the representability of violence, not its unrepresentability. So what went wrong with the analysis? How did it get off track? At this point it is wise to return to first principles, recalling that the constitutive axis for representation always has a relationship with the mode of production, not simply the ideological conceits and tricks of state power that are its epiphenomena....Consider the logic of how the thing that most permeates our daily lives will be the same thing that retreats from any tangible malleability in our hands and minds. But what are these things? We must speak of the information economy. We must simply describe today's mode of production in its many divergent details: the diffusion of power into distributed networks, the increase in local autonomous decision making, the ongoing destruction of the social order at the hands of industry, the segmentation and rationalization of minute gestures within daily life, the innovations around unpaid

micro labor, the monetization of affect and the "social graph," the entrainment of universalizing behaviors within protocological organization—these are the things that are unrepresentable.

The closest we might to representing the unrepresentable will likely come from embracing newer and more radical forms of knowledge production, and distancing ourselves from absolute claims to singular reality in exchange for multiple perspectives. All of the above forms of documentary production must be employed in harmony in order to grapple with notions such as Galloway's truth.

However, photographs that push the boundaries of visibility are incredibly powerful for reshaping our understanding of the culture we exist in. The *One Pixel Camera* (2014) by Canadian artist Dave Kemp reveals a final insight. By producing a camera that reduces an image to a single representative pixel, he questions the representational capacity of digital, photographic, and instrumental tools in general [Plate 22]. Using descriptive titles, Kemp draws our attention to what the camera was pointed at when taking a picture, and we are left to imagine just how accurately the resulting photo reflects its subject, or whether we should believe the captions at all. Obviously, one pixel is not enough to discern any useful visual function; however, conceptually it raises intriguing notions of what remains outside the purview of even the most detailed and vigorous visual representations.



Plate 22 - Dave Kemp, *The One Pixel Camera: Sunset at Grand Bend* (2014), 15" x 15" (printed at 0.0667 pixels per inch), 15 x 15 inches, 2014.

In these photographs, technology and its revelatory capacity is severely strained via the camera-object, revealing through absence a particularly veridical presence that can be located within the technology itself. This is what a pixel is, and this is what we are looking at, and this is how a computer renders a numeric formula. Kemp upends the normative aesthetic techniques used in documentary photography, yet somehow manages to remain firmly fixed within the same category. This is the strange power of the documentary photograph: it can exist in near complete abstraction yet still appear representative of the real. As such, it is hard to imagine a better format for engaging in a thoughtful dialogue with the unrepresentable place in which we live.



### 3.0 A HUMAN LABORATORY

“The whole point of taking pictures is so that you don’t have to explain things with words.”

– Elliot Erwitt

### 3.1 INTRODUCTION

The choice to photograph scientific instruments and the practice of scientific inquiry—particularly those aspects of both that are difficult to explain with images—is critical and reflexive.<sup>1</sup> I view the instruments and practices of science, along with the roles they play in society and culture, as sharing many inherent qualities with the artist’s camera and artistic practice more broadly. For example, both use instruments in the recording of worldly phenomena, both must translate inscriptions into symbolic forms of knowledge, both seek to grow our understanding of the world around us, and both are incredibly influential in the contemporary social landscape. There are further links, however, as the camera itself is a by-product of science and a tool used necessarily and recursively by science since its invention. Thus, an investigation of the camera via artistic practice and theory through the subject of scientific laboratories and instruments entices thoughtful reflection on how reliant we are on the functions of the camera, how intermingled it is with the culture of knowledge production, and the relationships that are constructed if the two are analyzed in tandem.

As an introductory example, evoking the weight of history and fact through text and placing it next to photographs of the laboratory might begin to illuminate the joys and miscalculations of scientific production. Here I refer to *A Human Laboratory*, my publication resulting from the production-based research carried

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<sup>1</sup> Further examples of the dissemination of my own work can be found in the Appendices: Exhibition Documentation.



out in conjunction with this dissertation. *A Human Laboratory* features 105 photographs from 31 research centres, laboratories and field stations, offering a representative, rather than exhaustive, visual exploration into scientific inquiry. The sites that I chose to photograph were selected with several practical concerns in mind, such as: my opportunity to gain access to photograph particular facilities and scientific instruments, ensuring that a variety of scientific areas of investigation and branches of science were included, and inclusion of the many varying forms (and scales of) scientific instruments in use today. Conceptually, less formal and more exploratory choices directed which laboratory to visit next. These conceptual choices were less rigid and are more productively expressed as a series of questions that continuously arose during my site visits: what is visually shared between seemingly different fields of scientific inquiry? How much do the instruments rely on visual inscription to produce new knowledge? How hidden from view are such inscriptions within the increasingly digital laboratory, and do they follow a new logic when compared to their analogue counterparts? What associations can be constructed by my camera (and how it functions) with the instruments being photographed?

Such questions are further absorbed by the formal conventions of the photograph and the photographer, like the choices regarding framing (inclusion/exclusion of subject matter), the use of the 4x5" analogue view camera, the necessity of long exposures due to poor lighting conditions, amongst many others. As such, *A Human Laboratory* functions within its own set of limitations and potentials. For example, it also exists in relation to the extended theoretical text offered in chapters one and two. There is also a sequence, several formal templates in how the images are arranged, and there is curated historical and factual text throughout; all making reference and conforming (loosely) to an academic template. Viewers must turn the pages at their own pace and can choose how long to linger on any particular element. This dynamic is essential to mention because the artist's book is itself an interface, one of many that constructs understanding of the photographs contained therein.

The particular arrangement of photographs and text within *A Human*

*Laboratory* invites viewers to consider the relationship between discoveries and technologies, the camera as an instrument of discovery via its functional relationship to the devices being photographed, and the potential failures and futures of instruments as they dissolve into the visual abstraction of a black-box phenomenon [Plates 28-76]. Via text, the neutrality of facts is ultimately contested as conflicting historical accounts of scientific discovery eventually emerge through a sequential yet structurally unfixed narrative. The “footnotes” introduced into the layout of what would otherwise be a familiar artistic publication, hybridize the visual and scientific formats that often seem so unrelated, ultimately raising questions as to their relationship and inviting new “discoveries” that the viewer might imagine. However, the photographs and text of *A Human Laboratory* are not intended to be rigidly fixed within this singular boundary of the artist’s publication.



Plate 23 - Installation View, *Instrumental*, ArtLAB Gallery, London, Ontario, 2016.

As in an artist’s publication, every gesture of public display too offers an opportunity to reframe the function of the photographic camera and its resulting inscriptions. Various manners of display reconfigure the images produced for this

production-based thesis through different sets of interpretable symbolic gestures. The exhibition titled *Instrumental* (2016) at the ArtLAB Gallery, for example, combined interactive elements and abstracted photo-works alongside more traditionally hung photographs. Further, a small room with its own entrance was constructed at the centre of the gallery to exhibit photographs of historical instruments from the University of Toronto's Science Instrument Collection (UTSIC). Entering the space triggered a motion sensor which temporarily activated a fog machine [Plate 23]. This simultaneously made the photographs more challenging to see, made reference to the various tropes of the "scientific experiment" itself, while evoking notions of the by-products of many early technologies, such as fire, steam, and combustion (and even more sinister devices, such as gas chambers). Nearby, four framed panels at a life-size scale of the server computers at CERN at were produced to mimic their real counterparts. Upon closer inspection by the viewer, the photographs of CERN's server computers would be set into subtle motion, revealing their representational nature through an uncharacteristic bobbling gesture [Plate 24]. Examining the panels would also trigger sounds of a typical server room (the characteristic whirling of fans and subtle electronic tones) that would echo through the gallery space, forcing viewers to reconsider the photographs throughout the gallery space within the context of the digital nature of scientific inquiry.



Plate 24 - Installation View, *Instrumental*, ArtLAB Gallery, London, Ontario, 2016.



Plate 25 – Installation View, *Instrumental*, Art Gallery of Mississauga, Ontario, 2016.

At the Art Gallery of Mississauga, *Instrumental I* (2016) appeared almost concurrently with the above exhibition in a different configuration. A photograph of the world's highest altitude supercomputer at ALMA (located in the Atacama Desert over 6000 meters above sea level) manipulated via Photoshop was displayed on a life-size scale. Elements of this photograph (of a particularly busy looking server computer) were digitally removed from the original image, framed, and then floated in front to simulate the original composition, introducing a third dimension to the image [Plate 25]. Behind the floating frame, the manipulation of the original photograph (the “removal via software” of the server computer) remained apparent, gesturing to Adobe Photoshop's *Spot Healing Brush Tool*.<sup>2</sup> This gesture is itself a

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<sup>2</sup> Adobe's summary of the Spot Healing Brush tool: “The Spot Healing Brush tool quickly removes blemishes and other imperfections in your photos. The Spot Healing Brush works similarly to the Healing Brush: it paints with sampled pixels from an image or pattern and matches the texture, lighting, transparency, and shading of the sampled pixels to the pixels being healed. Unlike the Healing Brush, the Spot Healing Brush doesn't require you to specify a sample spot. The Spot Healing Brush automatically samples from around the retouched area.” See: “Retouch and Repair Photos,” Adobe Help Center, accessed April 25, 2018, <https://helpx.adobe.com/uk/photoshop/using/retouching-repairing-images.html>.

symbolic visual cue, recognizable in how Adobe Photoshop's Spot Healing Brush Tool attempts to simulate the visual textures that surround the area being "healed"; though in this case, it failed to do so in any convincing manner, instead malfunctioning despite its "correct" usage. This visualization of the software failing becomes symbolic, and can then be considered in conjunction with both the contemporary and historical images of scientific instrumentation throughout the exhibition. My aim was to evoke relationships that are difficult to describe otherwise; it was firmly grounded in both an aesthetic and politic of incoherence of radical documentary that would point to the inherent manipulation of data that is *necessary* within contemporary scientific inquiry. This "mistake", in the case of the poorly Photoshopped image behind the framed photograph, was covered up by a more legible image that seemed to recover the lost data behind it, yet would only appear correct if looked at via a particular, and partial, perspective. This gesture of display poses a question regarding the accuracy of the tools of representation but provides no final answer for the viewer. Its relationships to the other images of objects from the UTSIC collection creates some new and intangible form of visual knowledge via its relational experience, and presents a visual experiment with a thesis but no conclusion.

Finally, the exhibition *A Human Laboratory* (2018) at the McIntosh Gallery featured a narrator's voice that animated the text and the images found within the artist's book. On display were historical instruments from the University of Toronto's Science Instrument Collection: *Arm Restraint* (202.psy.72), *Mask for Vision Constriction* (2012.psy.138), and *Rosenzweig Picture Frustration Test (Adult and Child)* [uncatalogued]. This combination of media, and the installation strategies that linked them together, further confused the already somewhat decontextualized photographs adorning the walls. The exhibition was meant to challenge a more simplistic reading of photographs and their subjects, introducing unique relationships into a questioning array of visual forms. This exhibition was by no means a conclusive exploration of the scientific laboratory and its varying instruments; it too presented a visual experiment, expanding and linking symbolic representations that have no way of existing together anywhere but in the gallery.

In the preceding chapters, I described what might be considered an ongoing “crisis of digital representation,” in the way that many of the hybrid material forms encountered today have become resistant to visualization. I propose that the artistic and visual understanding of the camera would benefit other forms of knowledge production such as scientific inquiry and the philosophy of technology, even if the translation is not a simple and direct one.<sup>3</sup> Just as we must consider photographs within a contemporary context, all scientific inscriptions too are riddled with hidden and specialized referents, and science’s disseminations have, as a result, become increasingly threatened by questions of veridical and representational accuracy. I consider the diverse yet linked functions of the camera—in scientific and artistic inquiry—an opportunity to construct a fruitful dialogue between artistic practice and the production of knowledge via technology. I refer specifically to the capacity of documentary photography to offer thoughtful and innovative approaches to questioning and reflecting on the role the camera inevitably plays in the collection, construction, and dissemination of vast visual forms of knowledge. But I also propose the camera as an instrument that, when used in an artistic context, can draw attention to the limits of representation, and share with other forms of technology what we have already discovered about the camera as an instrument: that technology is a cultural instrument, as capable of manipulating truth as it is in revealing it, and is thus as instrumental in shaping us as we are in shaping it. Producing unconventional images of the laboratory and of scientific techno-instruments inevitably broadens this conversation.

The difficult-to-visualize aspects of a techno-society happen to be the very same elements that are so critical to our understanding of our place as individuals within a digital and technological culture, and to our future as an information/digital

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<sup>3</sup> To extend this argument further, Michel Callon proposes that interaction and debate between the public (non-specialists) and the institution of science are entirely necessary to curtail the growing mistrust of specialized tools and processes. According to Callon, such engagements should be “aimed at broadening the circle of actors addressing the issue of technoscience and its applications. They replace an undifferentiated public consisting of citizens or anonymous consumers by differentiated publics with particular and contrasting competencies and points of view.” Michel Callon, “The Role of Lay People in the Production and Dissemination of Scientific Knowledge,” *Science, Technology and Society* 4, no. 1 (1999): 85–86.



society collectively. For example, data is a form of the nonvisual (mathematical) nature of many aspects of the pervasive digital culture that we have grown accustomed to; it exists as numeric values that must leap, via translation, into digestible yet incomplete visual forms for human consumption. Data is but one example of the many *unrepresentables* that hide behind our daily experience. Galloway refers to contemporary unrepresentable things from the Internet (sprawling and interconnected physical networks) to societal power dynamics and various hierarchical social relations:

We must simply describe today's mode of production in its many divergent details: the diffusion of power into distributed networks, the increase in local autonomous decision making, the ongoing destruction of the social order at the hands of industry, the segmentation and rationalization of minute gestures within daily life, the innovations around unpaid micro labor, the monetization of affect and the 'social graph,' the entrainment of universalizing behaviors within protocological organization — these are the things that are unrepresentable.<sup>4</sup>

Are some things unrepresentable even via an instrument as powerful as the camera? How might we attempt to visualize the critical and hidden elements of society? While Galloway refers to many social phenomena as interwoven and unrepresentable within contemporary visual interfaces, I argue that it is counterintuitive and even dangerous to cease all attempts at representing them. When technologies become inscrutable, they become harder to question and analyze. Rather than give up, new strategies of using the camera-instrument and its visual representations must continuously be mined lest we succumb to an even more indecipherable, Baudrillardian sign-order relationship. Another intriguing question arises: can we draw a relationship between such complex social and cultural phenomena and, say, scientific attempts at representing the elusive Higg's Boson particle, or the yet-to-be-discovered Dark Matter? There is no specific answer to this question, except perhaps in the form of another question: if scientific inquiry does not cease its attempts to represent such things in the face of a struggle with the

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<sup>4</sup> Alexander Galloway, *The Interface Effect* (Cambridge: Polity, 2012), 92.

potentially unknowable, why should visual culture construct such limiting boundaries?

In the preface to this dissertation, I introduced the notion that the great power of documentary photography lies in its incredibly diverse and ever-expanding functionality, while remaining encapsulated within a seemingly naïve technological instrument. The camera can seem naïve given its relatively simple functioning as an apparatus that records whatever is placed in front of it, as do most scientific instruments. Such instruments, however, do not function within a vacuum, but instead rely on various social and cultural actors to conceptualize, enact, and interpret their use. In Chapter Two I analyzed the difficulty the camera has penetrating the veil of technology; however, I also showed the many ways the camera and the photograph can function creatively within a documentary context, providing insight into surroundings that are difficult to visualize in any other way. Many of the strategies I discussed illuminate the camera and its role in creating new connections between subjects, forms, and physical materials, relying on the unconventional use of technology to provide an apt metaphor of the evolving camera. I do not propose these diverse modes of representation within a hierarchy of good and bad documentary photography; however, these distinctions are methodologically generated and are useful for categorizing their utility within a contemporary context of understanding.

Poetic documentary, for example, provides an aesthetically coherent approach to the construction of visual forms that lack a politic of coherence. In this mode, the multiple visual forms that are produced together rely on the reconfiguration of normalized symbolic representations that can create new meanings altogether, via their careful curation together, for viewers to consider. Since we cannot picture the complexity of scientific inquiry totally, perhaps the curation of various related yet visually unaligned documents might infer some associated and allied aspects of it. In this regard, a poetic documentary approach can, for example: (1) reconfigure a viewer's symbolic understanding of various forms of techno-instruments and spaces, such as historic, contemporary and cutting-edge manifestations (all with their own symbolic languages); (2) be firmly fixed

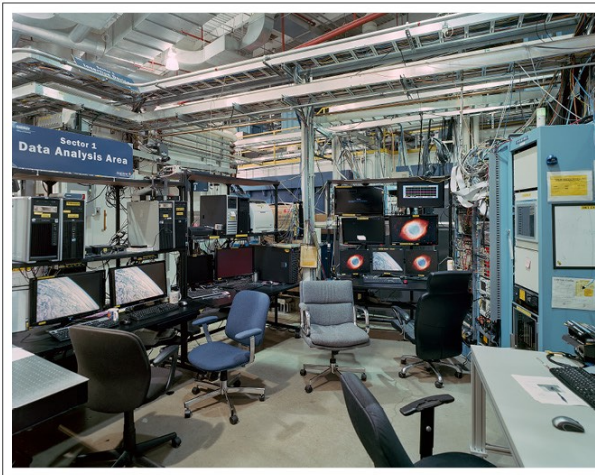


within a reality that we can recognize and have a tangible relationship with, via the camera's unique representational capacity sharing many similarities with vision; (3) make the symbolic more tangible through the unique amalgamation of the previous two concepts; and (4) remain somewhat neutral and considerate of the fact that knowledge is not necessarily fixed, and that it depends, at least in part, on the perspective and standpoint of the observer. This approach can begin to represent the unrepresentable. It can offer a way into those elements of society and culture that are too sprawling and complex to describe conclusively through a visual language that remains exploratory and encourages interpretation and interaction, while still feeling grounded within a tangible reality.

Returning to *A Human Laboratory*, the publication consists of many double-image spreads that also integrate text as figure descriptions, leading the viewer to: interpret each photograph singularly, both images in relation to each other, and then also the photographs in relation to the text that guides their interpretation. Such an arrangement encourages exploratory interconnection, rather than an acceptance of fact-like statements and images, as the photographs and text within rarely refer directly to one another. For example, Plate 26 consists of one photograph depicting a workstation with an abundance of monitors; many of which have a screensaver function displaying the same planetary formations. The figurative text below directs the viewer to consider the temperature which stars must maintain to function within our galaxy without "dying". The photograph below *it* depicts an institutional corridor of a quantum computing laboratory bathed in red light, while *its* text refers to Arnold Geulincx's 17<sup>th</sup>-century notion that the coincidence of mental thoughts and bodily motions function similarly to unconnected yet synchronized clocks.<sup>5</sup> This abstracted and symbolic vocabulary of images and text mines the viewers knowledges and experiences of such phenomenon as: the non-human and fantastic scale of planetary formations, how they might relate to their own bodily functions in

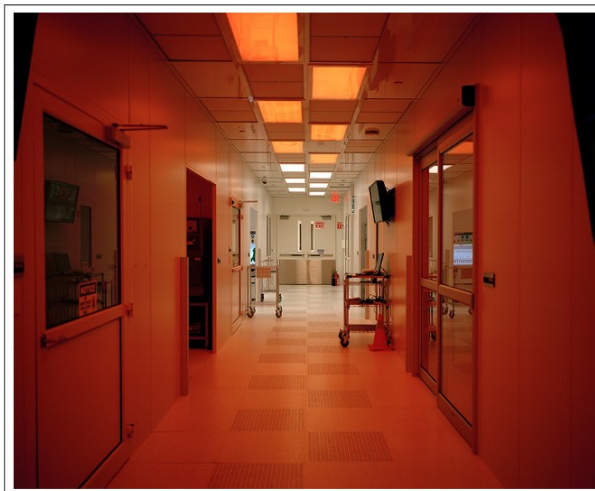
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<sup>5</sup> Arnold Geulincx, *Arnoldi Geulincx ... Saturnalia, Seu (ut Passim Vocantur) Quæstiones Quodlibeticæ in Utramque Partem Disputatæ* (Lugduni Batavorum: Ex Officinâ Henrici Verbiest, 1665).



*fig. 40 - All stars must maintain a temperature of at least forty million degrees in order to maintain their fuel supply.*

p. 60



*fig. 41 - The coincidence of mental thoughts with bodily motions is like the conformity between unconnected but synchronized clocks.*

p. 61

time and space, the colour red and its relation to institutional lighting apparatus and darkroom photography, the odd mixture of banal and extraordinary within the laboratory workspace, the synchronicity and precision of the galaxy, the screen and the screen-“saver”, amongst many other possible and fleeting thoughts.

**Plate 26 – Mark Kasumovic, *A Human Laboratory*, Artist’s Book, 2018. [Caption top: “fig. 40 – All stars must maintain a temperature of at least forty million degrees in order to maintain their fuel supply.”; caption bottom: “Fig. 41 - The coincidence of mental thoughts with bodily motion is like the conformity between unconnected but synchronized clocks.”]**

The category of “radical documentary” offers an even more exploratory mode through which documentary photography can penetrate the difficult-to-represent. In this mode of production, the aesthetic coherence of the visual field is deconstructed and reintroduced to the viewer, allowing for the recontextualization even of symbolic forms that we have grown accustomed to. The value of this gesture is measured by how it revises our relationship with normalized visual representations—in other words, how such images allow us to un-see the commonplace.<sup>6</sup> Again, the artist’s camera is so potent in this regard because it embodies a relationship with vision that is unique in the rendering of its subject. When this rendering is manipulated so that it introduces a sincere questioning of vision itself, whether within a single photograph such as in Gursky’s heavily photoshopped work or in relationship with other visual arrangements such as in Lynn Cohen’s extended series of stealthily staged work, new questions regarding technology arise for the viewer to consider. As Flusser suggests in *Towards a Philosophy of Photography*, the challenge for the photographer is to “oppose the flood of redundancy with informative images,” images that share new “information” and bring forth new ways of seeing.<sup>7</sup>

The scientific laboratory and the practice of scientific discovery provide a sophisticated subject for photography, one that has infiltrated every aspect of our daily lives. A subject so immense and interconnected exemplifies Galloway’s “unrepresentable.” When we think of the laboratory, for example, we might immediately envision a sterile, cold, and neutral environment. The popular images that might fill our imaginations are likely clichéd and inadequate, if not entirely harmful, to the way we continue to understand it. Alternatively, when we think of Hiroshima and Nagasaki, for example, we might think of corrupt human intentions and the concept of war. But rarely do we envision the choices and instruments that long before constructed the very possibility of mass extinction—ultimately linked to

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<sup>6</sup> I refer to commonplace (or clichéd) images as limited in their capacity to explain complex phenomena while remaining representative within culture due to a lack of more fitting images. Such images, like an image of a server room meant to visualize the Internet, can act to the detriment of expanding our visual field (and our understanding of evolving visual forms).

<sup>7</sup> Vilém Flusser, *Towards a Philosophy of Photography* (London: Reaktion Books, 2000), 65.

discoveries made in the laboratory. Further, when we consider Edward Burtynsky's photographs of environmental disasters we rarely consider the scientific discovery of the internal combustion engine as the leading cause of global warming. We might think instead of the automobile or factory as a visible marker of increasing pollution and climate change, because these are the images that are often associated with such occurrences when they are presented to us today.

Likewise, we rarely consider the camera itself as linked to such phenomena. However, we must consider the camera's fundamental and foundational effect as primarily an instrument of recording, and the role that this simple function has played in the proliferation of scientific and the technical objects capable of destruction. Is it worthwhile to consider such abstract and far-fetched associations? Most philosophical thought would imply that it is indeed worthwhile—even critical—as the neutrality of technology is mythical, and will inevitably veer towards control, as it is bound to the social functions that control it. Considering that the camera has such great potentialities ingrained in its core functionality, and is technically related to so many other forms of technology, such relationships are worth exploring.

The opportunity I had to photograph in some of the most advanced and expansive global laboratories internationally provided me a glimpse into the often surprising similarities between the instruments of science and the artist's camera. Contemporary devices constructed to record phenomena in the lab may be more elaborate regarding scale and specificity but nevertheless function within the same mode as the photographic camera. Inscriptions from these devices vary in complexity, from the scribble in a notebook to the overwhelming collection of data stored on server computers throughout the world. However, the images presented of scientific inquiry through traditional media outlets, such as magazines, newspapers, and scientific research centres, often contain an implicit bias and rationale that differs from that of artistic activity. Ideological in nature, the images that are typically produced by such outlets are: (1) created to show scientific activity "in action", where the scientist is featured prominently in order to humanize images of technology, (2) tied to recent and significant innovations that are framed by a

newsworthy narrative of “discovery”, and (3) produced to justify scientific activity to the public as a beneficial element of cultural activity, which is often subsumed by a narrative of “technology as progress/future”. The artist’s camera can function quite differently; however, as it is less likely to be tied to these prevailing ideologies. For example, when I photographed at various laboratories, research centres and field stations, it became more interesting to photograph them without the scientist within the frame (or perhaps appearing less prominently than usual), and to discover aspects of the laboratory that are typically not photographed by the aforementioned outlets. Including the messes that were left at workbenches and desks, the imperfections in architecture, the leaks in the ceilings above supercomputers, and the personal items of scientists, all offered a view of the laboratory that is not typically circulated to the public. Many images within *A Human Laboratory* distance themselves from conventional representations of scientific activity, and instead feature subject matter such as foosball tables or the ironic placement of motivational posters. Considering that such images are rarely disseminated; the resulting photographs offer viewpoints that the public is rarely privy to. For example, *Corridor (Cosmic Ray Experiment)* and *Vault #3 (Seed Storage Experiment)* are two photographs that vary wildly from typical depictions of laboratories, as they feature empty rooms devoid of the excitement often associated with scientific spaces. The architectures photographed serve as either connecting spaces amongst a labyrinth of interconnected technologies, or as storage areas that are not yet being put to use. What is framed by these photographs is not the exciting activity of science, but the peculiar architecture of it all, and the reality that its design is reflective of how

science itself wishes to be observed. While the corridor in *Corridor (Cosmic Ray Experiment)* could exist almost anywhere, its colour palette sincerely suggests the particularities of the *futuristic* science lab [Plate 27]<sup>8</sup>.

The camera, and by relation, vision, is indeed futile as a tool for understanding technology if it is not employed with some ingenuity. Rather than attempting to *elucidate* via photographic representation, the purposeful placement of the camera (relating to perspective and vantage point) to highlight the density of techno-instruments, can otherwise allude to the notions of extreme technological complexity. For example, images such as *Painter's Tape (Synchrotron Experiment)* were purposely framed to reveal as many indecipherable layers of technology as possible, where the viewer's eye is eventually lead to the back wall consisting of a periodic table of elements (another abstracted and dense product of scientific inquiry) [Plate 28]. It is true that photographs of a synchrotron laboratory or a server room say little about the motivations, intentions, and functions of scientific experiments, progress, and ever-evolving technologies. However, by showing the laboratory as chaotic and overflowing with bizarre architectural and electronic connections, much more lucid descriptions can come about. The laboratory is here

revealed as provisional and haphazard.

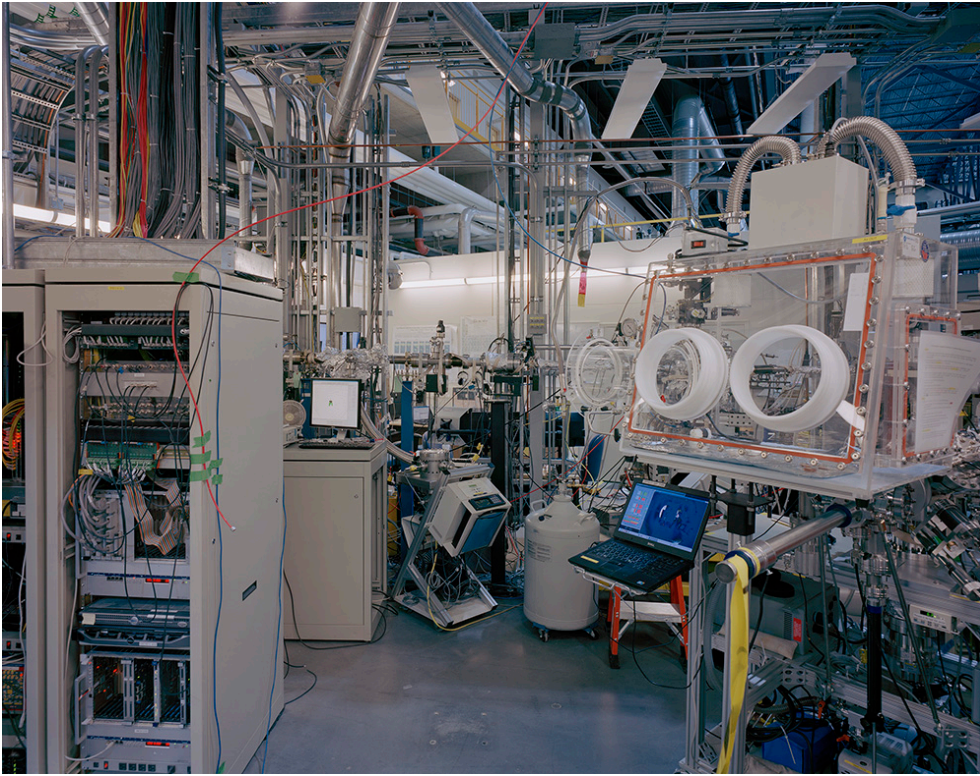


Plate 27 – Mark Kasumovic,  
*Corridor (Cosmic Ray  
Experiment)*, 2016.

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<sup>8</sup> NASA, The National Science Foundation, DARPA, and many other science-based institutions feature blue prominently in their logos and disseminations, perhaps due to its links to creativity.





*Plate 28 – Mark Kasumovic, Painter's Tape (Synchrotron Experiment), 2016.*

Considering the laboratory with regards to the relatively banal electronic components that are so undecipherable in photographs—the symbolic nature of scientific instruments and inquiry can be made apparent via the repeated notion that human knowledge is indeed heavily codified and increasingly intangible (dare I say, inhuman). If the primary tool we collectively rely on to understand our visual world is so inadequate for describing contemporary visual reality, it sincerely amplifies the Baudrillardian notion that we are enveloped within a reality that has little relationship with the material forms that surround us. Indeed, we need to consider this notion thoroughly and repeatedly. The only way we can begin to understand the symbolic nature of contemporary reality is to move beyond limited and traditional representations and put to work the symbolic language that we can (somewhat) already understand. Poetic and truthful photographic documents are armed with such potent functions. These categories specifically, via a politic of incoherence, can employ the inventive notions of radical experimentation towards novel interconnections that Feyerband espouses in a visual way. Poetic and radical documentary photographs—again given their political incoherence—can further be

used and reused in varying contexts and forms to develop meaning in surprising and unanticipated ways.<sup>9</sup>

Much like contemporary technology, “documentary” photographs in all of their contexts have indeed become a necessity. Try as we might, it is difficult to contemplate a culture in which we do not rely on their existence to bring meaning to the world. This shared similarity with scientific inquiry is instructive of the extent to which we all value the *poiēsis* of the human condition, the desire for meaning-making in all aspects of our lives. As Heidegger suggests, the chain of ordering can only be broken by reflecting on the very tools used to investigate that which we are forced to question. The camera is such a tool concerning the technology of “inquiring” instruments. It is no longer worthwhile to question how the camera is broken; how it does not represent with direct and full accuracy. That has become irrelevant since Magritte’s *Treachery of Images*. We know that images are not entirely real, but it is precisely because we rely on them so heavily, and must continue to employ them, that the documentary photograph remains so endlessly and utterly revelatory.

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<sup>9</sup> Some of these functions in my own artistic practice have already been explored and can be found within the exhibition documentation section of the Appendices, including: ArtLAB Gallery (London, Ontario), The Art Gallery of Mississauga (Ontario), Double Happiness Projects (Toronto, Ontario), and the McIntosh Gallery (London, Ontario).



### 3.2 MONOGRAPH EXCERPTS, “A HUMAN LABORATORY”

*A Human Laboratory* is an artist publication consisting of one-hundred photographs taken during site visits to thirty-five research centres, laboratories and field stations over the course of five years (2013-2018).<sup>10</sup> The dimensions of the publication measure twenty-eight centimeters by thirty-three centimeters and it consists of 153 full colour pages. There are two primary design elements that repeat throughout the main body of the publication: double page spreads which feature a single image with figure caption on each of the facing pages, and double page spreads which feature a single image and figure caption (including a “footnote” marker) on the left page, and a text-only “footnote” description page on the right page. A list of figures follows the main body of the publication, providing further image title details referencing each figure that can be found throughout the book. Finally, a section titled “Interpretive Glossary” exists at the end of the publication, creatively elucidating on some of the terms that can be found throughout the textual elements of the publication.

*A Human Laboratory* was produced in conjunction with this production-based thesis to perform three critical functions: (1) to compile a significant selection of the photographs taken during the course of this thesis, where it would be difficult to do so otherwise, (2) to serve as a reference and elaboration to the capstone exhibition that had run in conjunction with the defence of this thesis (see Appendix - Exhibition Documentation), and (3) to function as a potential example of *radical documentary* that I describe within the previous section. As a brief introduction to the publication excerpts that can be found below, I will briefly elaborate on the above functions and how they contribute to the over-arching framework of this thesis project.

The photographs taken during site visits to thirty-five laboratories are difficult to exhibit in their entirety due to limitations in space in all but the largest galleries and museums. The majority of the photographs found within the

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<sup>10</sup> For a complete list of research centres, laboratories and field research stations visited, please see Appendix – List of Site Visits.

publication are taken on 4x5 inch negatives, with an intention to exhibit each individual photograph at a scale of 101 x 127 cm. I considered it worthwhile to reproduce the photographs in a publication as references to the exhibition sized prints, where the expectations of image size are informed by the general size constraints of the book form. The book format also allows for the partial simulation of sequencing and pairing that a large-scale exhibition would inevitably entail, and provides an opportunity to experiment with how particular photographs influence and inform each other's "readings". While I had taken over 500 photographs over the course of this project, the images that can be found within *A Human Laboratory* serve as reflective of the variety and scope of this greater selection.

*A Human Laboratory* also serves as both a foundation and a reference to the final exhibition of the same title held at the McIntosh Gallery from June 6-30<sup>th</sup>, 2018. The primary element of the exhibition consisted of the projection of the very same publication spreads via two projectors (via a two-channel video with a runtime of 60 minutes). Within the exhibition, the text within the figure captions and the text within the "footnote" pages are audibly narrated by professional voice actors (see Appendix – Exhibition Documentation). Viewers of the exhibition have the choice of examining the work via the publication placed within the gallery, or as a time-based video work via the projections within the gallery space.

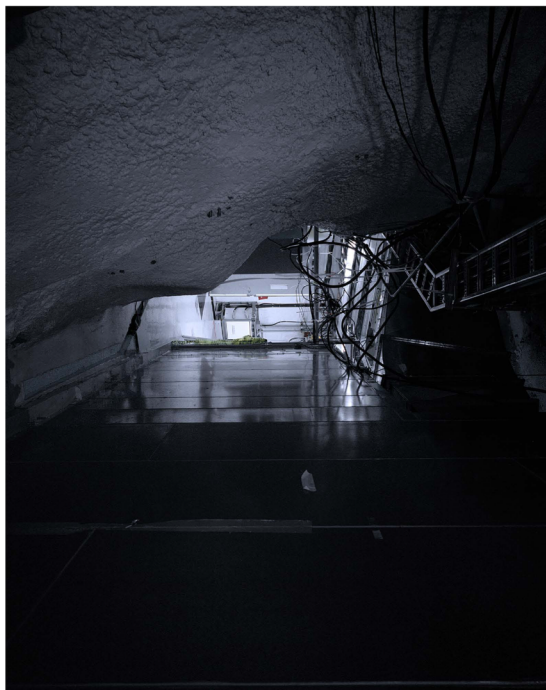
Finally, *A Human Laboratory* functions as a form of radical documentary as outlined in the previous chapter. The intention is to frame images of technology, the laboratory, and scientific activity within an aesthetic and politic of incoherence. This is achieved by presenting photographs with figure descriptions that consist of scientific facts, but in a manner that does not enhance the function of the photographs via direct reference. Instead the photographs are decontextualized via text that conceals references to time and of individuals, and combines "factual" statements that have minimal relation to each other. Further, the reader has no reliable resource for determining the validity of such factual statements, and is forced to interpret each text in relation to the image it might be paired with (which may also seem somewhat unrelated). Considering captions are often used to elucidate the contents of photographs, this strategy purposefully confuses the

typical relationship found within image/text relationships, especially those found within scientific publications. Further, many figure descriptions within the publication direct the viewer to an additional page of footnotes, consisting of an interpretable array of additional statements (that are also often related, but questionably so). The motive behind this rather cryptic relationship between image, text and facticity is constructed in order to induce illogical and unexpected relationships between the viewer and the content of the publication, and to inspire a questioning with regards to what relationships and contradictions may exist within the body of work.

What follows is a forty-seven page excerpt of the original publication of *A Human Laboratory*, published in June 2018. This selection of excerpts is reflective of the variety of content that can be found throughout. In order to preserve the size relationships of the elements within the publication, the figure descriptions from the original publications are described within the plate descriptions [plates 29-76] where necessary and difficult to read.

4  
HUMAN  
LABORATORY

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Mark Kasumovic

Plate 29 – Mark Kasumovic, *A Human Laboratory*, Book Excerpt [Front Cover], 2018.

Fig. 1 - *A human laboratory*



Plate 30 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 1 - A Human Laboratory."]



**Fig. 2** - A parade of six megaliths mark the position where Sirius, the bright 'Morning Star,' would have risen at the spring solstice. Nearby are other aligned megaliths and a stone circle, perhaps from somewhat later.

Plate 31 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 2 - A parade of six megaliths mark the position where Sirius, the bright 'Morning Star,' would have risen at the spring solstice. Nearby are other aligned megaliths and a stone circle, perhaps from somewhat later."]



**Fig. 3** - *Someone squares the lune, a major step toward squaring the circle.*

Plate 32 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 3 - Someone squares the lune, a major step toward squaring the circle.*”]





**Fig. 4 -** Evidence of astronomical calendar stones are found on the Nabta plateau, near the Sudanese border in Egypt.<sup>1</sup>

Plate 33 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 4 - Evidence of astronomical calendar stones are found on the Nabta plateau, near the Sudanese border in Egypt. <sup>1</sup>”]



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## **1. Foxes, *Radio Telescope Experiment*,**

A continuous record of solar and lunar eclipses is kept in Mesopotamia.

Someone conceives a mechanical model of the world, in which the Earth floats very still in the centre of the infinite.

Someone maintains that permanence is an illusion and the only possible real state is the process of becoming.

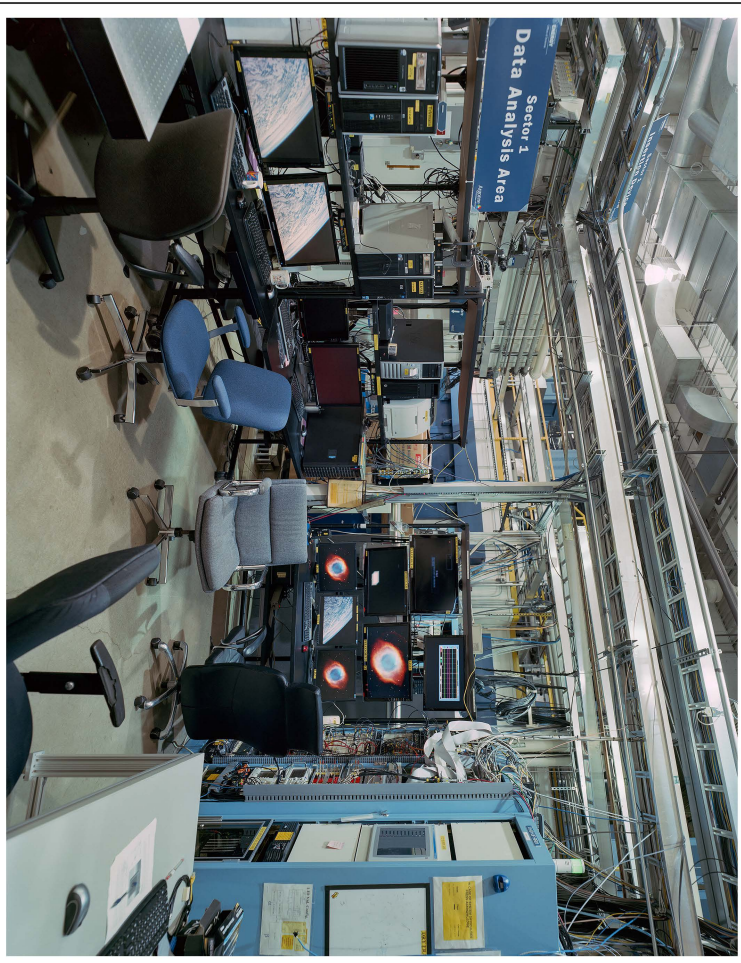
Someone says that the world consists of imperceptible individual particles, that differ only in size, shape, and position.

Someone calculates the diameter of the earth.

Someone proclaims that consciousness ends with death, and that there is no immortality of the soul.

Someone compares the moon to the earth, upholding the idea of a plurality of worlds.

Plate 34 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



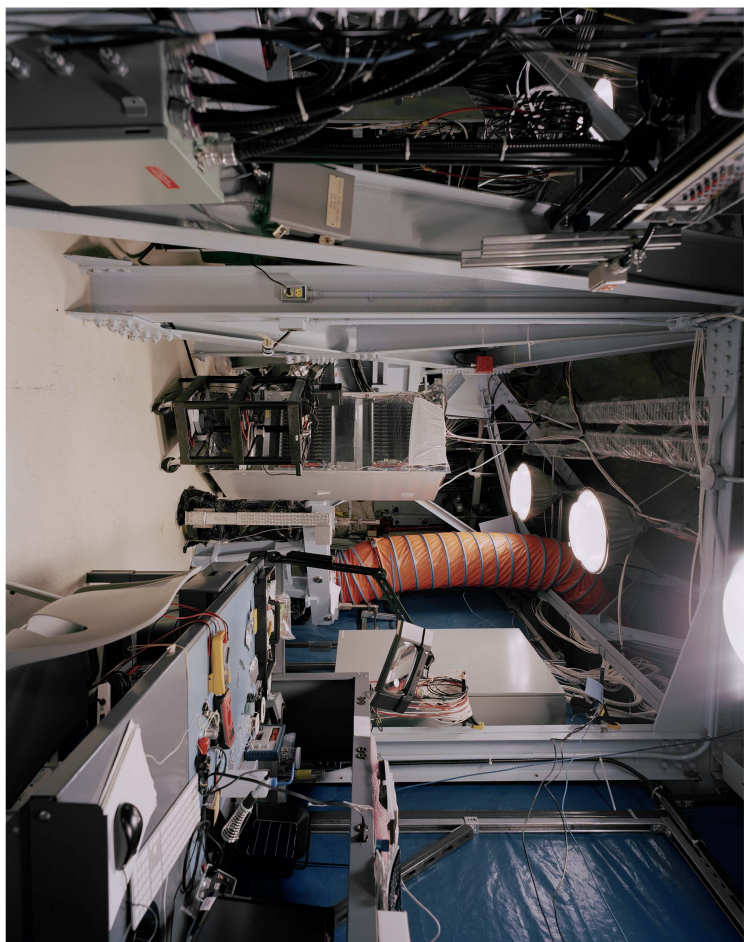
**Fig. 5 - All stars must maintain a temperature of at least forty million degrees in order to maintain their fuel supply.**

Plate 35 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 5 - All stars must maintain a temperature of at least forty million degrees in order to maintain their fuel supply."]



**Fig. 6 -** *The coincidence of mental thoughts with bodily motions is like the conformity between unconnected but synchronized clocks.*

Plate 36 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 6 - The coincidence of mental thoughts with bodily motions is like the conformity between unconnected but synchronized clocks.”]



**Fig. 7** - Vision is the consequence of the formation of an image on the retina by the eye's lens.<sup>2</sup>

Plate 37 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 7 - Vision is the consequence of the formation of an image on the retina by the eye's lens.<sup>2</sup>"]

## 2. Cloistered Room, Dark Matter Experiment,

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The primary rainbow is produced by sun rays entering the eye at an angle of about 41 degrees.

In their mind's eye, someone sees lines of force traversing all space.

Mathematicians see centres of force attracting at a distance.

Someone invents the *ophthalmoscope*, a small instrument which when pressed against the eye enables the vessels to be seen.

Someone correlates Rapid Eye Movement during sleep with when dreams are particularly vivid and emotionally charged.

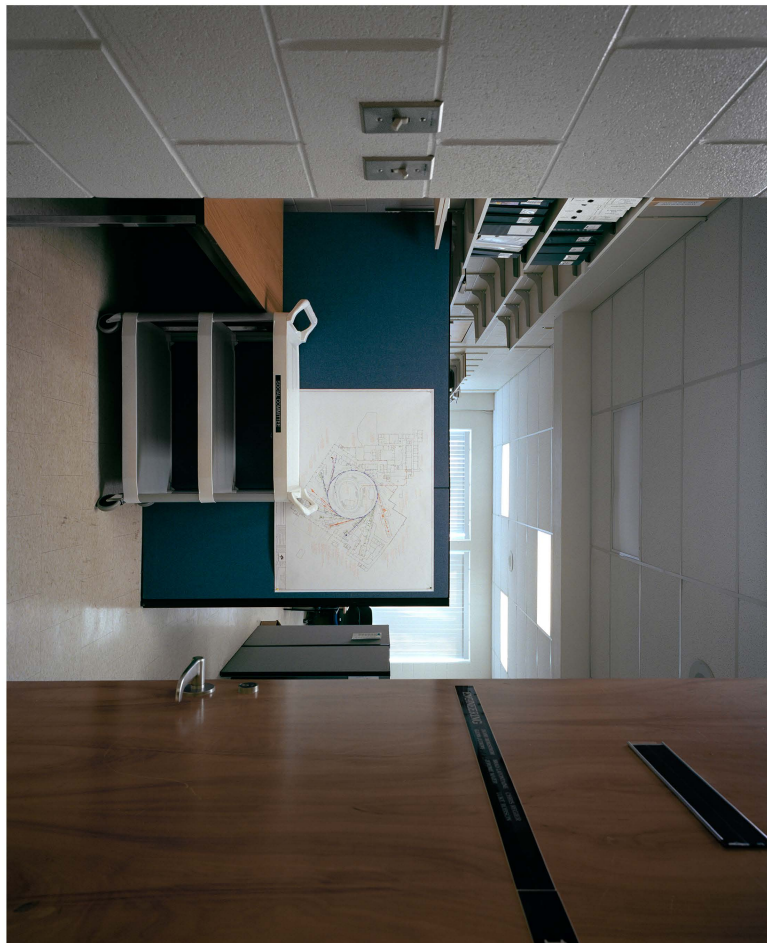
What we see in the periphery, just outside the direct focus of the eye, may sometimes be a visual illusion.



**Fig. 8 -** *Without consciousness, 'matter' dwells in an undetermined state of probability.*



Plate 39 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 8 - Without consciousness, ‘matter’ dwells in an undetermined state of probability.”]



**Fig. 9 -** *The number of neocortical neurons limits an organism's information-processing capacity.*

Plate 40 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "*Fig. 9 - The number of neocortical neurons limits an organism's information-processing capacity.*"]

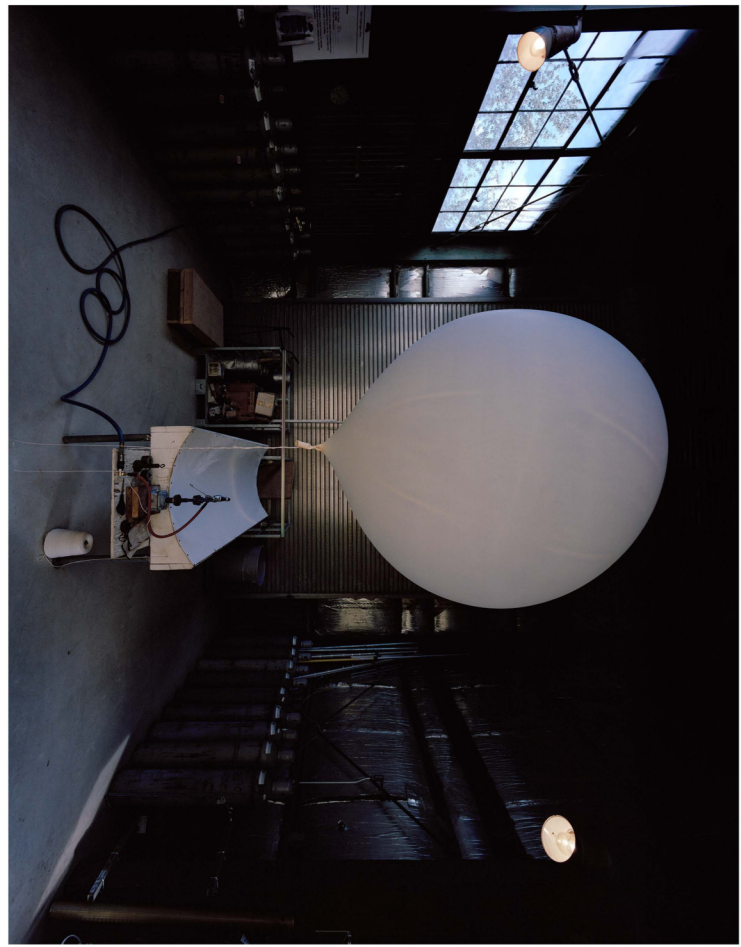


Fig. 10 - The shape of the heaven is necessarily spherical.<sup>3</sup>

Plate 41 – Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 10 - The shape of the heaven is necessarily spherical.<sup>3</sup>”]



3. Balloon, Weather Research Laboratory,

Someone notices the moon shines with the light of the sun.

Someone publishes a map of the known world.

Someone proclaims that the earth is at the center of the universe.

Someone discovers that the corpus striatum, now called the basal ganglia, acts as the brain's receiver for sensory data.

Someone describes nitrogen as *residual air*.

Someone publishes a book called *Evidence of Man's Place in Nature*.

Someone coins the term *biosphere* for where life can exist.

Someone invents the first steam engine, paving the way for the Industrial Revolution.

The world population reaches one billion.

Someone suggests that burning coal will enhance the *greenhouse effect*, which is beneficial for future generations.

Someone isolates ozone, naming it from the Greek word *ozein*, to smell.

Non-linearities in weather phenomena make them unstable when subjected to small changes in their energy cycles.

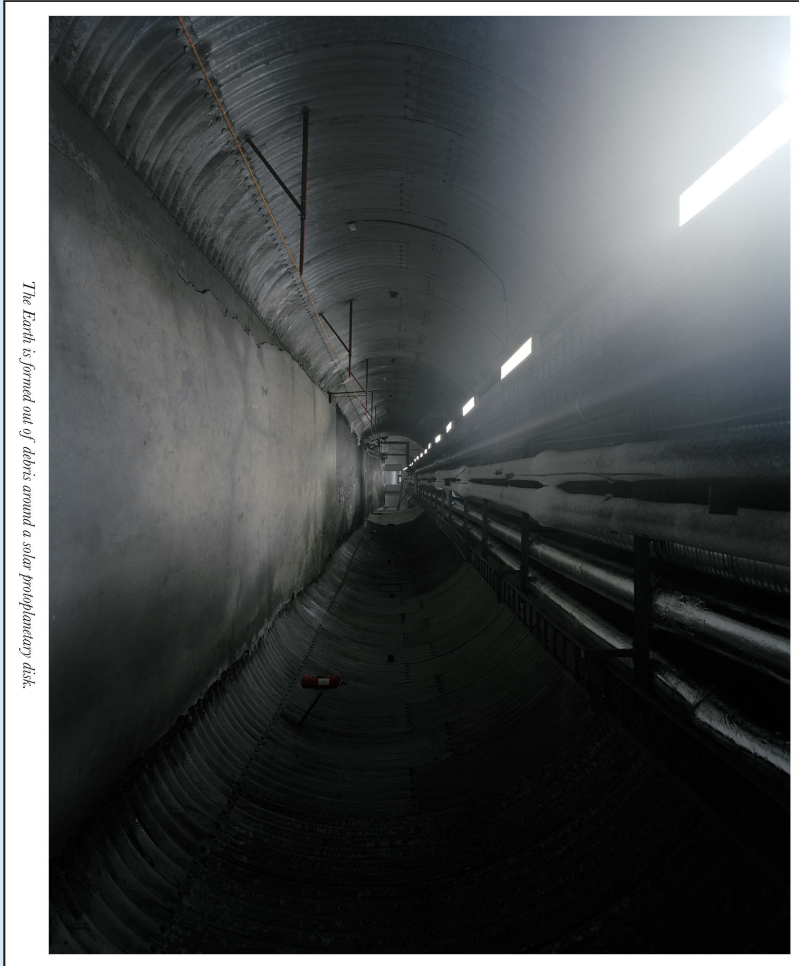
The world population reaches seven billion.

Plate 42 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.

Case Study No. 1  
*The Svalbard Global Seed Vault*

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Plate 43 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



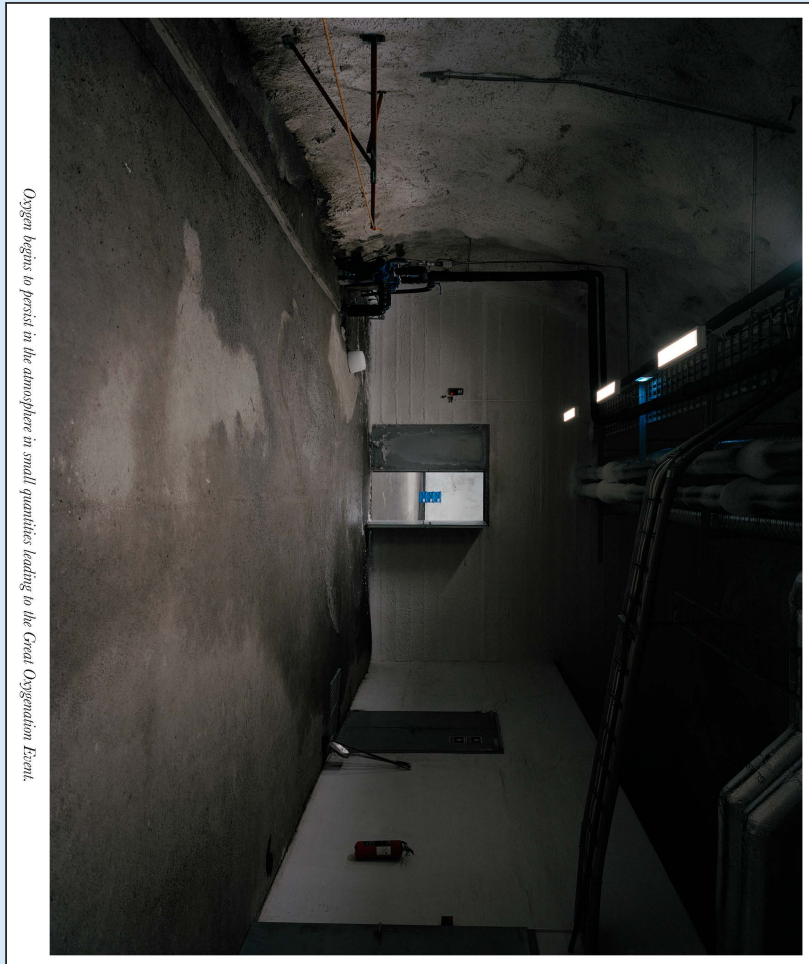
*The Earth is formed out of debris around a solar protoplanetary disk.*

Plate 44 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "The Earth is formed out of debris around a solar protoplanetary disk."]



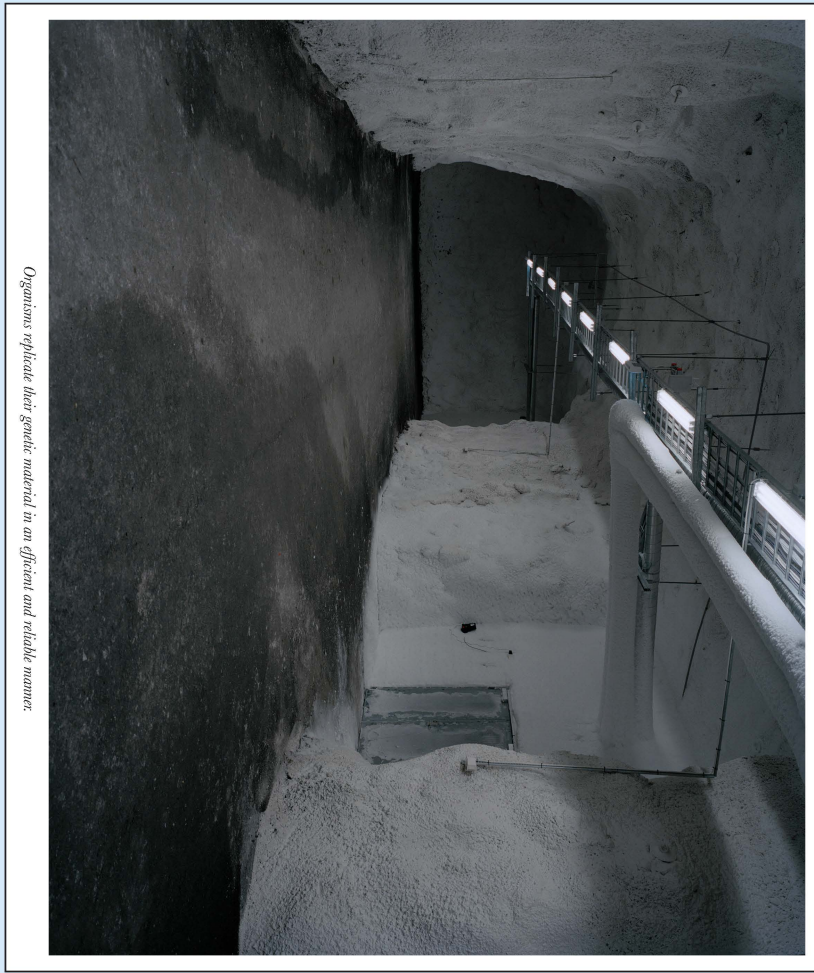
*Life in the Archean is limited to simple single-celled organisms.*

Plate 45 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Life in the Archean is limited to simple single-celled organisms."]



*Oxygen begins to persist in the atmosphere in small quantities leading to the Great Oxygenation Event.*

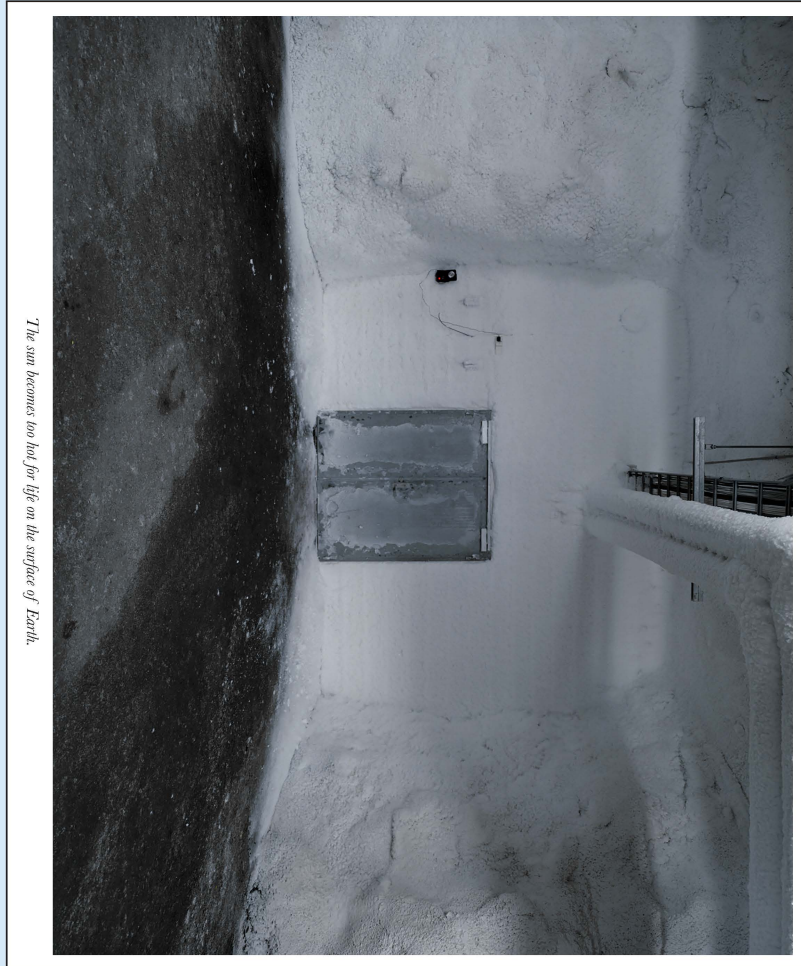
Plate 46 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Oxygen begins to persist in the atmosphere in small quantities leading to the Great Oxygenation Event."]



*Organisms replicate their genetic material in an efficient and reliable manner.*

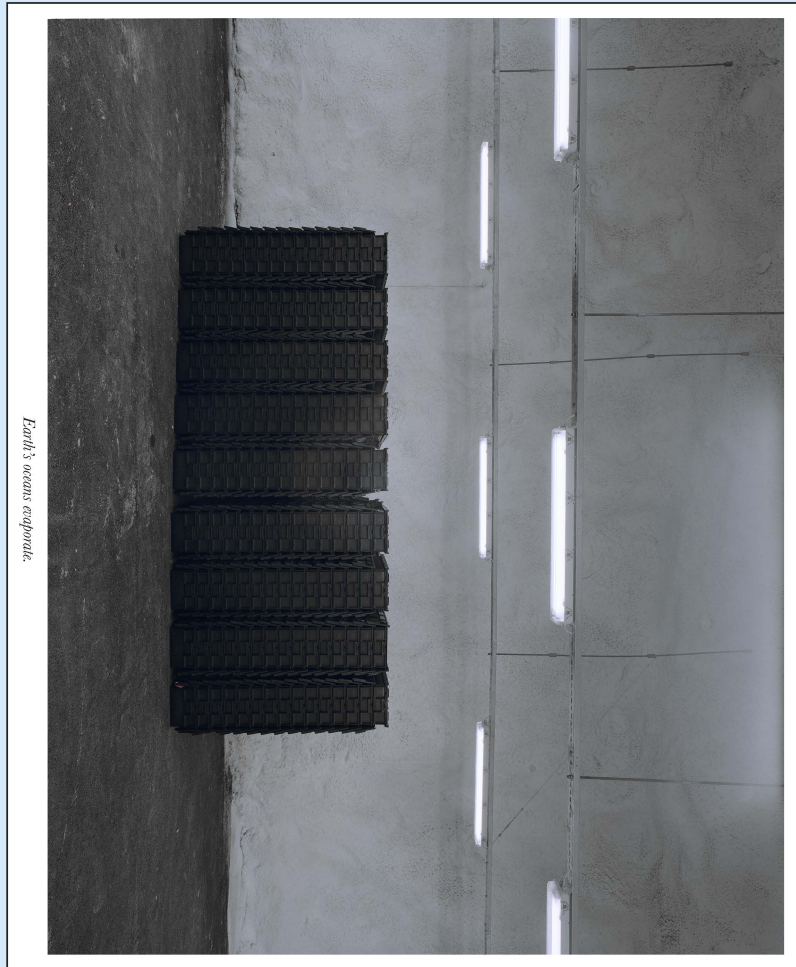
Plate 47 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "*Organisms replicate their genetic material in an efficient and reliable manner.*"]





*The sun becomes too hot for life on the surface of Earth.*

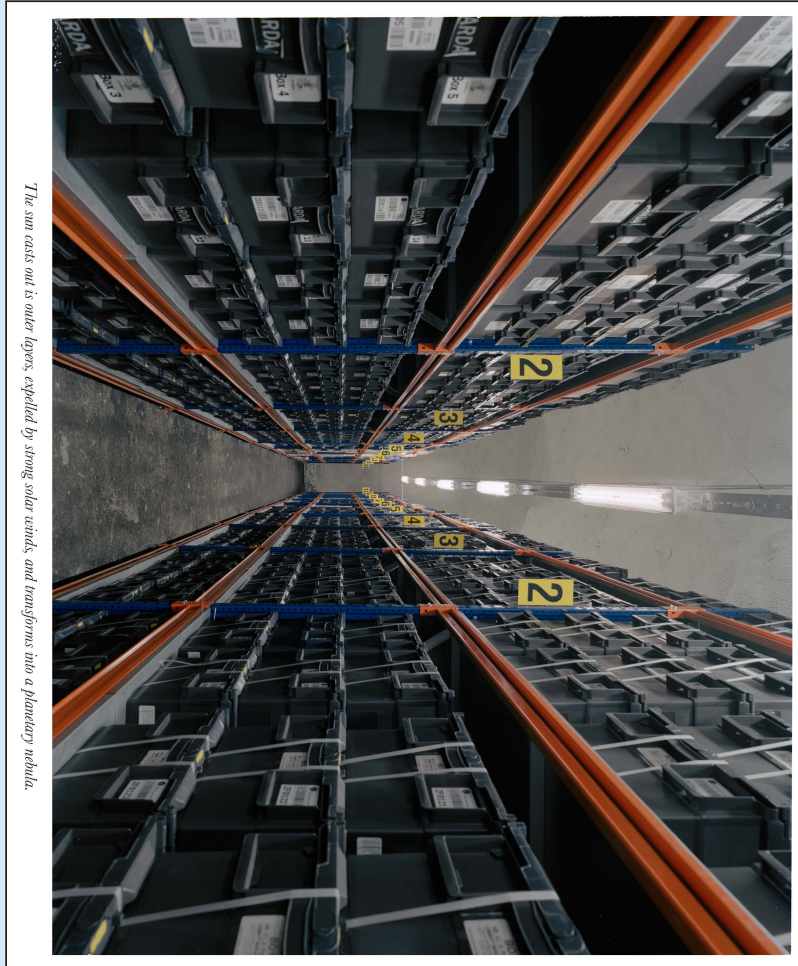
Plate 48 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "*The sun becomes too hot for life on the surface of Earth.*"]



*Earth's oceans evaporate.*

Plate 49 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Earth's oceans evaporate."]





*The sun casts out its outer layers, expelled by strong solar winds, and transforms into a planetary nebula.*

Plate 50 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "The sun casts out its outer layers, expelled by strong solar winds, and transforms into a planetary nebula."]

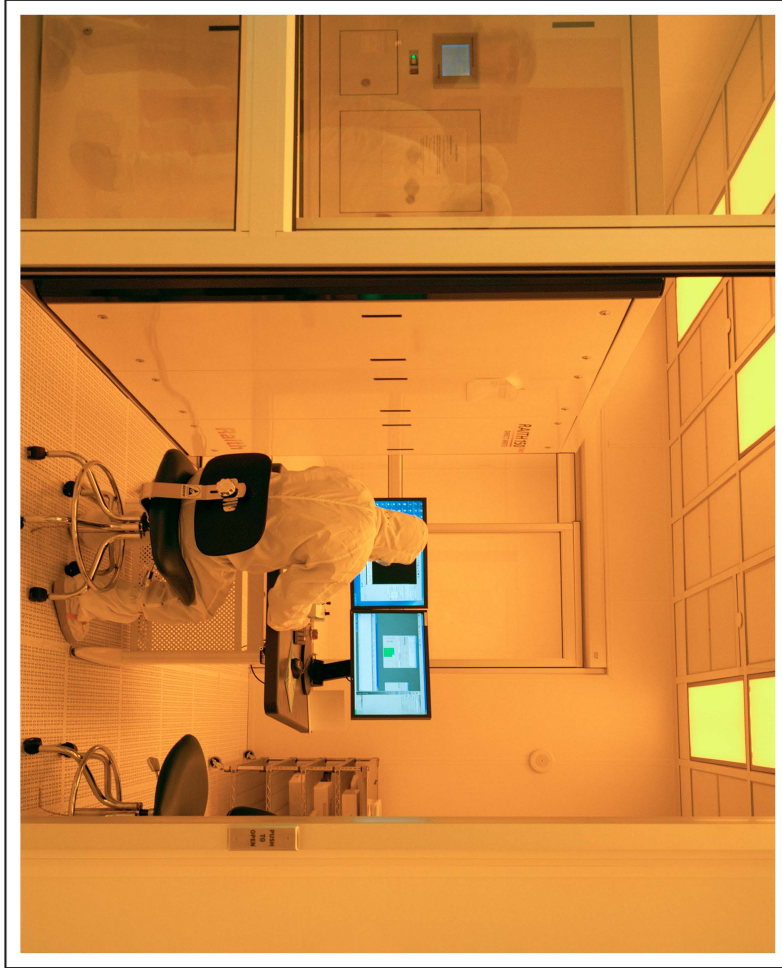


Fig. 11 - Reality does not exist until it is measured.<sup>4</sup>

Plate 51 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 11 - Reality does not exist until it is measured.”<sup>4</sup>]

#### 4. **Re**fections, *Quantum Experiment*,

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Someone is writing the first scientific history; that is, they begin by asking questions, rather than just telling what they think they know.

Atoms vibrate, hitched together in solid bodies, existing in a space which is infinite in extent and in which each star is a sun and has its own world.

Someone proclaims that universals are abstractions from particulars.

The soul is itself material and so closely associated with the body that whatever affects one affects the other.

Crossbows with sights and mechanical triggers are introduced into warfare.

The universe is predetermined and the individual soul has no immortality;

Something can be true in rational philosophy but false in religious belief.

Plate 52 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



**Fig. 12 -** *Being must be regarded as the ultimate abstraction that can be applied to everything that exists*

**Plate 53 -** Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 12 - Being must be regarded as the ultimate abstraction that can be applied to everything that exists.*”]



**Fig. 13.** Like a hologram, a three-dimensional volume of space is entirely encoded onto its two-dimensional surface.

Plate 54 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 13 - Like a hologram, a three-dimensional volume of space is entirely encoded onto its two-dimensional surface."]



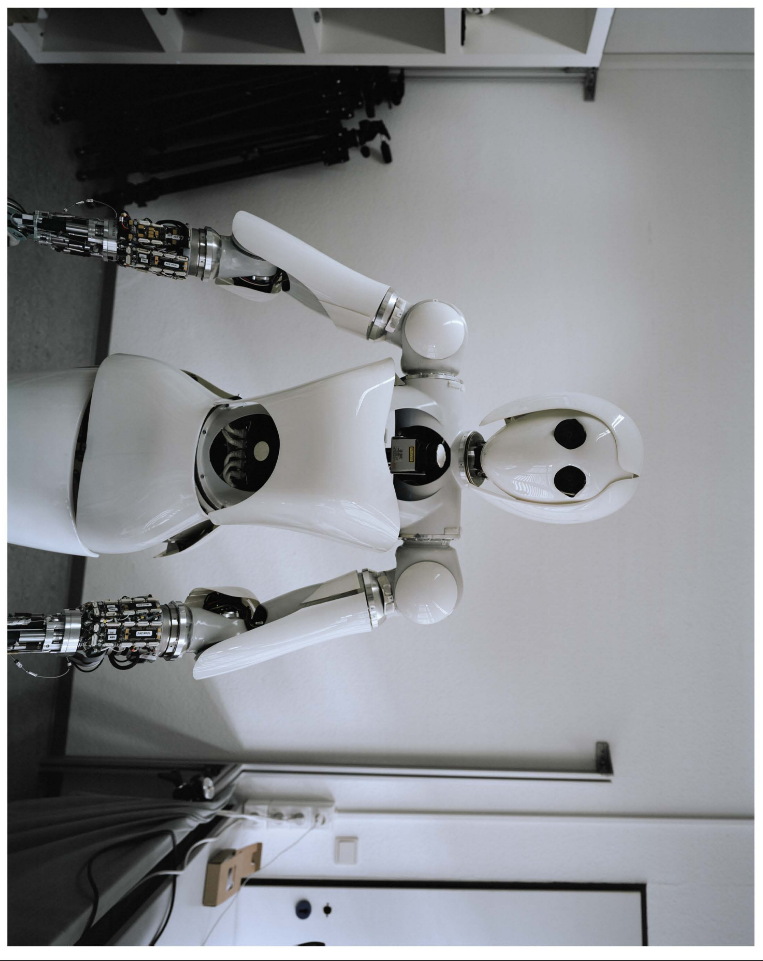


Fig. 14 - All living things originate from eggs.<sup>3</sup>

Plate 55 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 14 – All living things originate from eggs.<sup>5</sup>"]

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## 5. Aila, *Artificial Intelligence Experiment*,

They believe that in principle, organisms can be spontaneously generated, and that the process is the self-generation of a complicated machine.

Someone publishes Man-Computer Symbiosis.

They describe a machine that humans can relate to.

Plate 56 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.

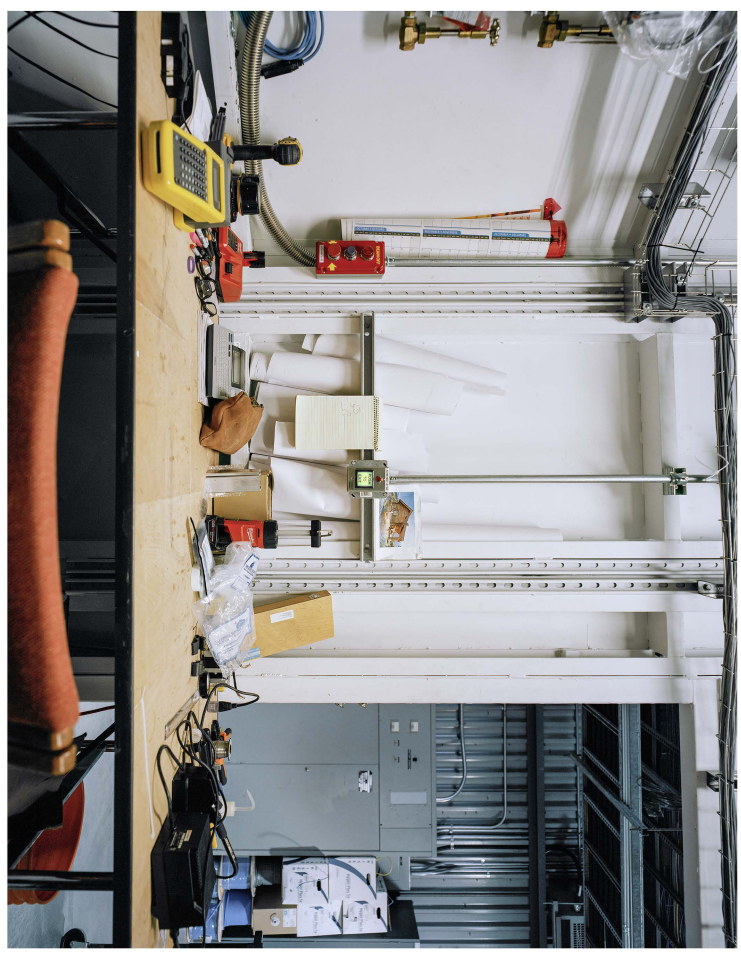
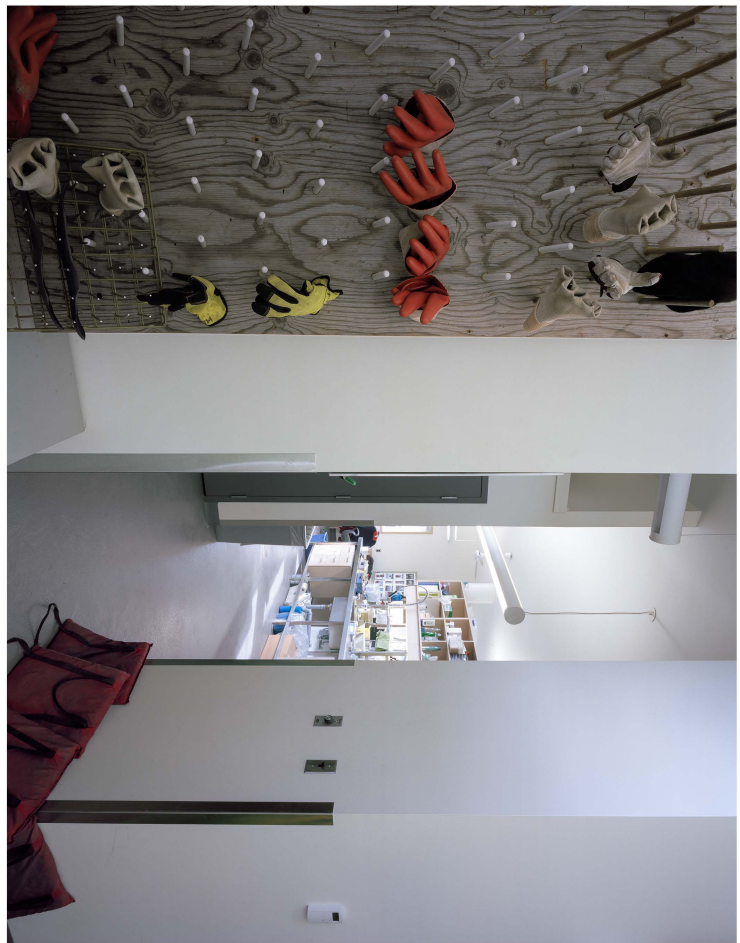


Fig. 15 - The basic stuff of nature is water. Wherever there is life, there is moisture.

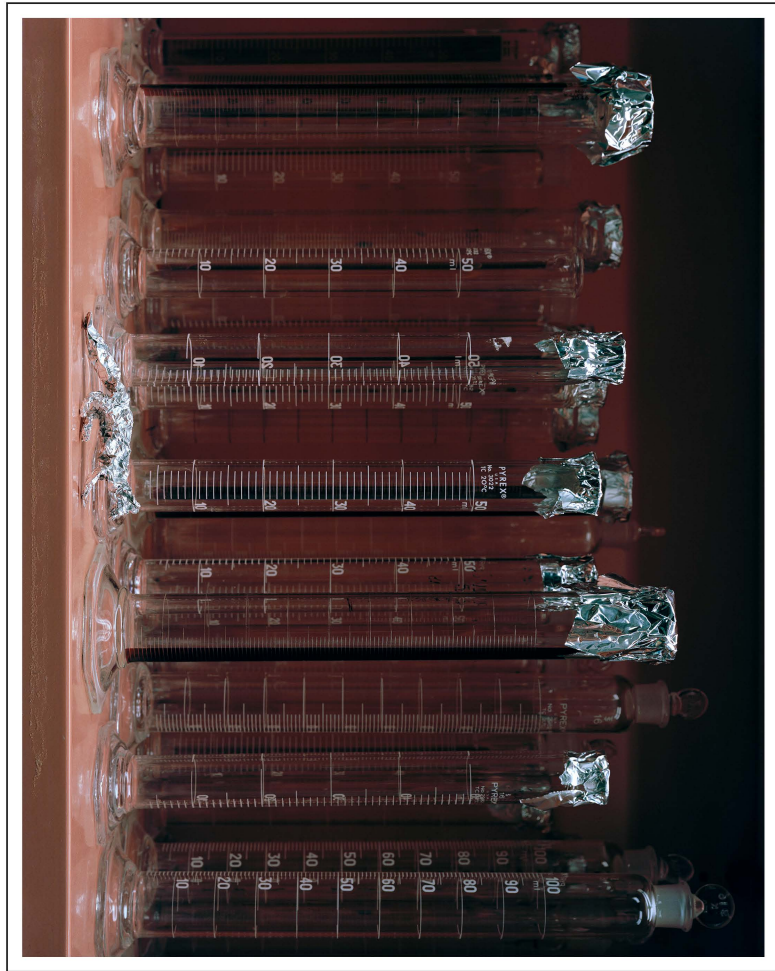
Plate 57 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 15 - The basic stuff of nature is water. Wherever there is life, there is moisture."]





**Fig. 16 -** *The elements Fire, Earth, Air and Water mix and separate under the guidance of two opposing principles: Love, which draws them together, and Strife, which drives them apart.*

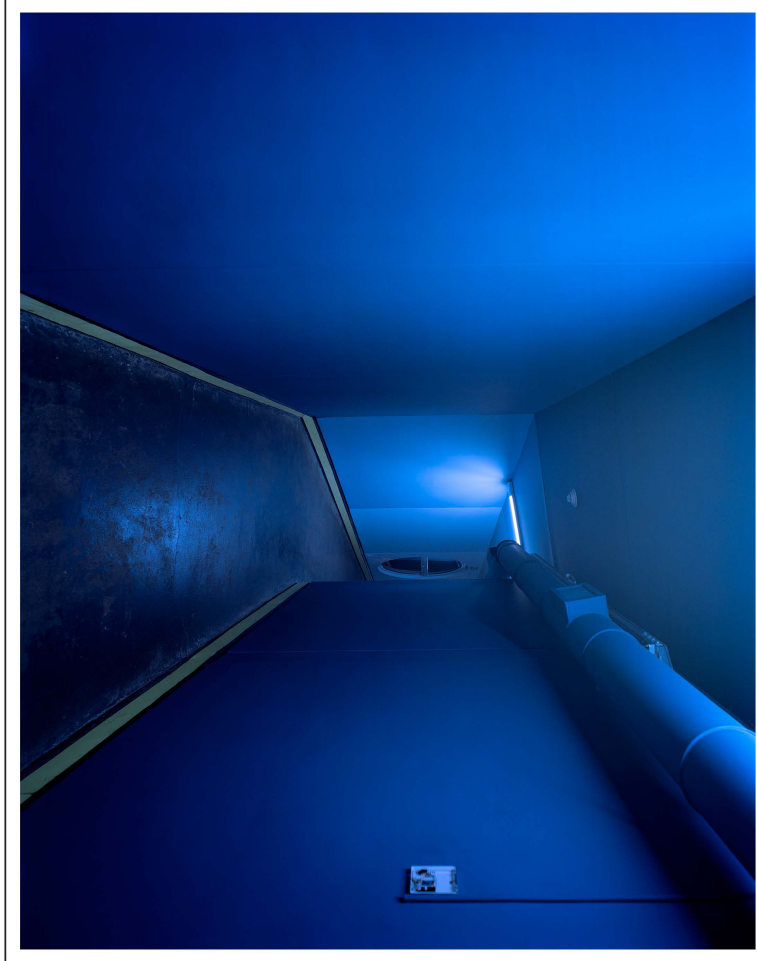
Plate 58 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 16 - The elements Fire, Earth, Air and Water mix and separate under the guidance of two opposing principles: Love, which draws them together, and Strife, which drives them apart.”]



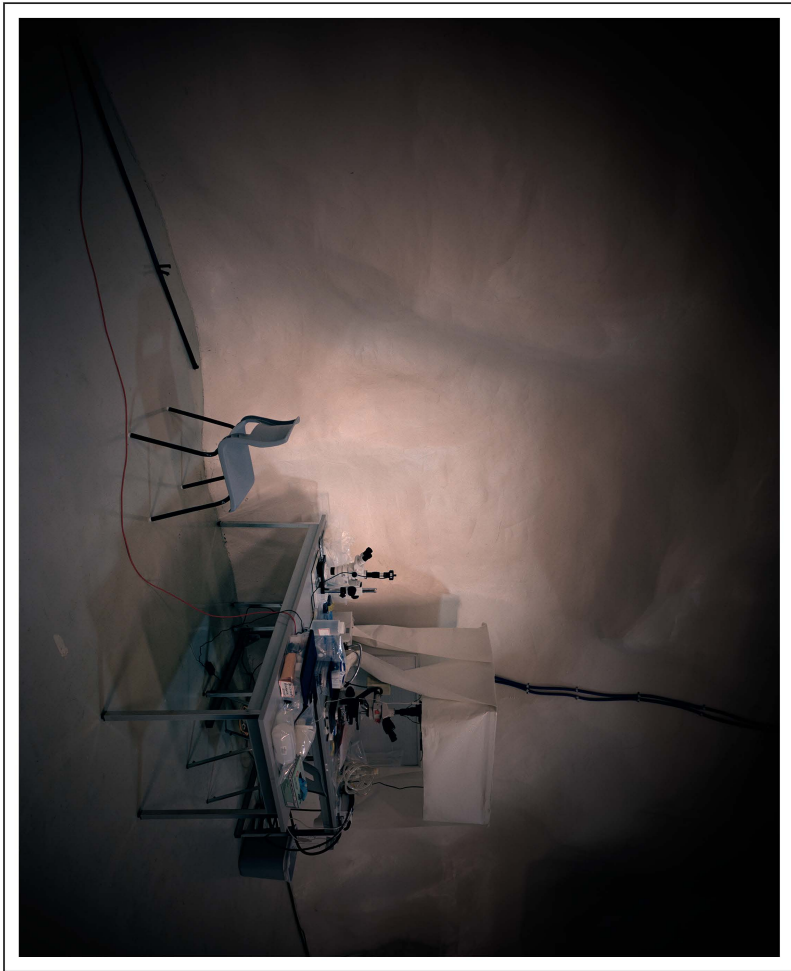
**Fig. 17 -** *Animals have memories, reason, and other psychological characteristics of man.*

Plate 59 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 17 - Animals have memories, reason, and other psychological characteristics of man.*”]

**Fig. 18 -** *A male robin will be more diligent in caring for its young if the eggs its mate lays are a brighter shade of blue.*



**Plate 60 -** Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 18 - A male robin will be more diligent in caring for its young if the eggs its mate lays are a brighter shade of blue.*”]



**Fig. 19 -** *Certain physical systems can become entangled, meaning that their states are directly related to the state of another somewhere else.*

Plate 61 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "*Fig. 19 - Certain physical systems can become entangled, meaning that their states are directly related to the state of another somewhere else.*"]



**Fig. 20 -** *There is no association of the particular present with any particular past.*

Plate 62 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 20 - There is no association of the particular present with any particular past.”]



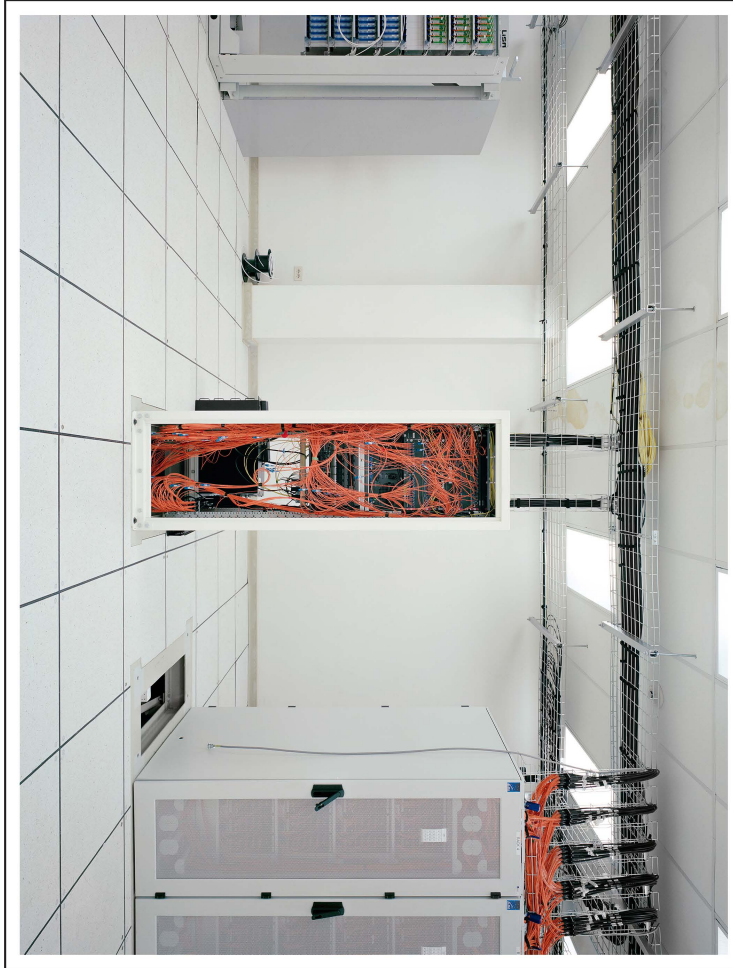


Fig. 21 - Someone builds a clock which keeps track of calendar cycles, computing the future date of Easter by using various lengths of chain.<sup>6</sup>

Plate 63 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 21 - Someone builds a clock which keeps track of calendar cycles, computing the future date of Easter by using various lengths of chain.”<sup>6</sup>]

## 6. Leak, *Radio Telescope Experiment*,

Someone says that evolution is invoked as a universal principle, that involves progress through stages toward greater complexity;

Someone believes that the internal human environment is balanced or self-correcting, that disease states are often extreme manifestations of normal processes.

Someone publishes a paper showing that interconnections between functional sites of the brain make more complex intellectual functions possible.

Someone suggests that gene duplications promote the evolution of organisms toward greater complexity.

Someone suggests that the selective reinforcement of neural connections accounts for learning and memory.

This reinforcement causes the brain to organize itself into *cell assemblages*, the building blocks of information.

Someone proves, in theory, that a *cellular automaton* could reproduce itself provided it exceeds a certain threshold of complexity;

Someone identifies the organic molecule formaldehyde in interstellar space.

They also believe that *polyatomic molecules* are formed, perhaps, when large particles of carbon capture other atoms in interstellar dust and form more complex organic molecules.

Someone acknowledges that the border between order and chaos lies complexity, i.e. life and its constraints.

Plate 64 – Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



**Fig. 22 - Quantum entangled particles can exchange information instantaneously over vast cosmic distances.**

Plate 65 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 22 - Quantum entangled particles can exchange information instantaneously over vast cosmic distances."]





**Fig. 23** - Markov chains describe sequences of randomly linked probability variables in which the future variable is determined by the present variable, but is independent of the way in which the present variable arose from its predecessors.

Plate 66 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 23 - Markov chains describe sequences of randomly linked probability variables in which the future variable is determined by the present variable, but is independent of the way in which the present variable arose from its predecessors.”]

Fig. 24 - Proto-Indian writings appears in the Indus Valley?



Plate 67 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 24 - Proto-Indian writing appears in the Indus Valley."]

## 7. Radio, *Lake Experiment*,

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Someone is using phonetic signs, deriving them from Egyptian hieroglyphics in the Sinai peninsula.

Someone writes using the alphabet, in thirty cuneiform signs.

Someone dissects a brain and distinguished between the cerebrum and the cerebellum.

A newspaper is circulated in Rome.

Someone compiles about six thousand folio pages in the encyclopedia of knowledge.

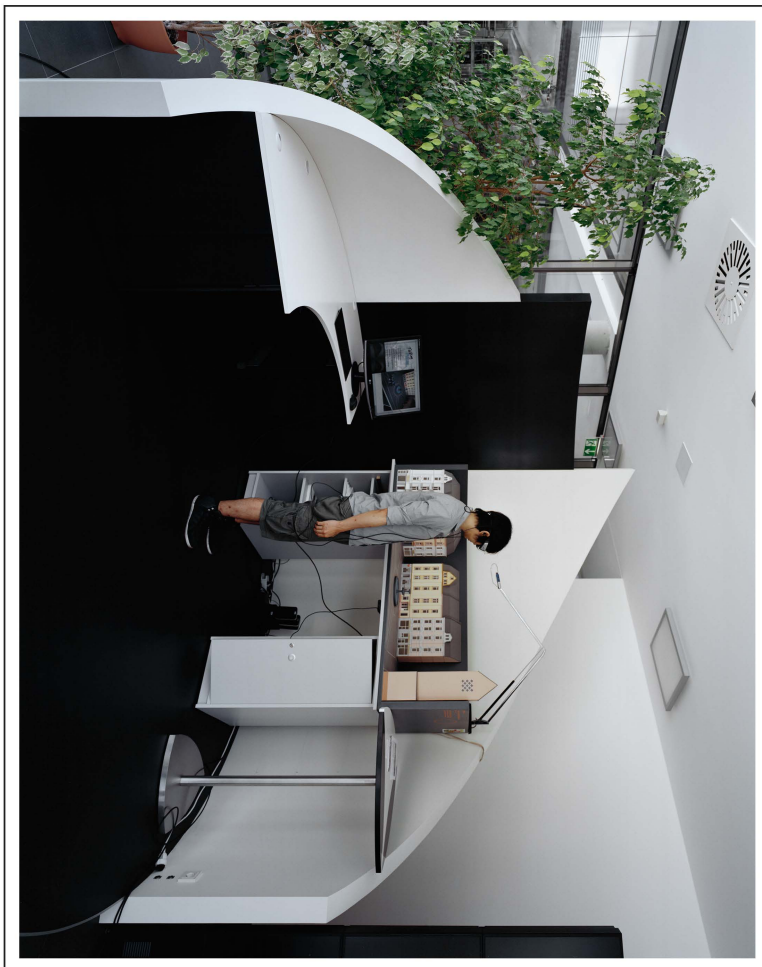
It contains knowledge gleaned from the translations of Greek and Arabic books on philosophy, science, and mathematics.

A rapid and sustained trans-Atlantic telegraphic cable is laid, capable of detecting small changes in volages over a great distance.

Someone designs a microprocessor. An integrated circuit semiconductor chip which is able to receive instructions and send data.

Someone indicates that humans are probably born with two language areas, but the left area is innately able to soon dominate.

Plate 68 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



**Fig. 25** - *Rapid Eye Movement during sleep is correlated to when dreams are particularly vivid and emotionally charged.*

Plate 69 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 25 - Rapid Eye Movement during sleep is correlated to when dreams are particularly vivid and emotionally charged.*”]



**Fig. 26 -** *By agitating a bacterial culture, mating can be stopped. This permits the manipulation of only a few genes at a time.*

**Plate 70 -** Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “*Fig. 26 - By agitating a bacterial culture, mating can be stopped. This permits the manipulation of only a few genes at a time.*”]





*Fig. 27 - Objects have a reality only in their relations. All else is imagination.*

Plate 71 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "*Fig. 27 - Objects have a reality only in their relations. All else is imagination.*"]



*Fig. 28 - Being must be regarded as the ultimate abstraction that can be applied to everything that exists.*

Plate 72 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: "Fig. 28 - Being must be regarded as the ultimate abstraction that can be applied to everything that exists."]

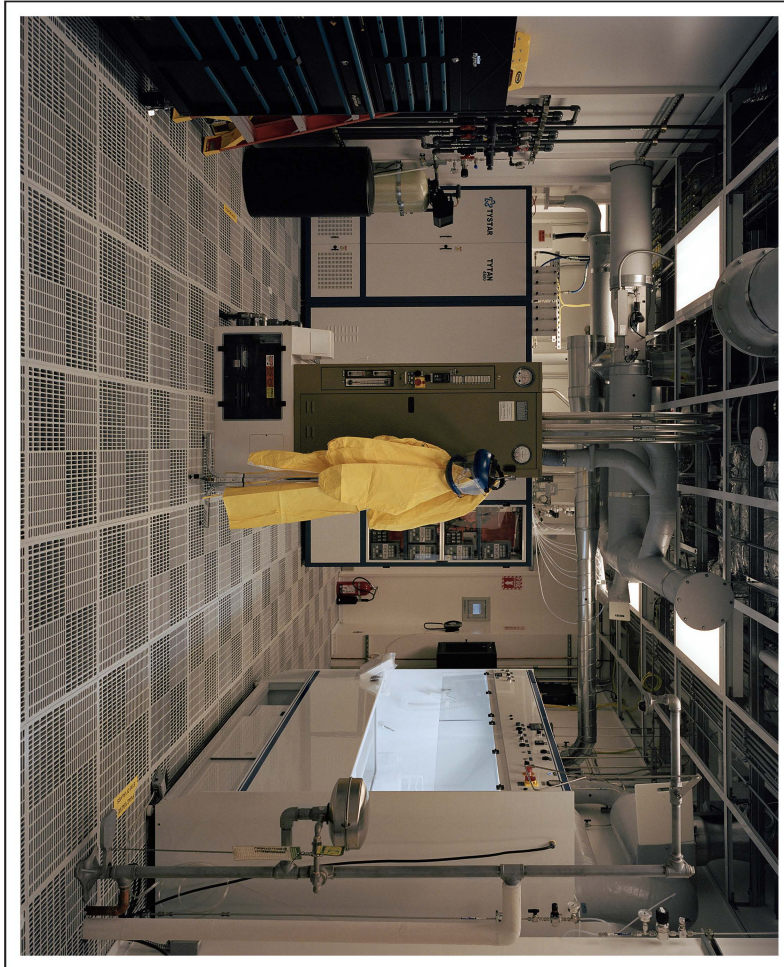


Fig. 29 - The implication of being incomplete is the need for additional, or hidden, variables.<sup>89</sup>

Plate 73 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018. [Caption: “Fig. 29 - The implication of being incomplete is the need for additional, or hidden, variables.”<sup>89</sup>]



## 8. Hazard Suit, *Quantum Experiment*,

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The *world soul* is constructed according to mathematical principles, and, therefore, these principles are already fixed within the individual.

The immune system discriminates between *self* and *nonself*.

When their colony is threatened by an intruder, workers tear their own body apart, releasing toxins that kill or hold off the enemy.

Humans and chimpanzees are the only primates known to frequently engage in warfare.

Animal species with males who compete intensively for mates might be more resilient to the effects of climate change.

Although conservation initiatives can save endangered species, sometimes chance can override such efforts.

Plate 74 - Mark Kasumovic, *A Human Laboratory*, Book Excerpt, 2018.



**Figure 1**  
*A Human Laboratory (Gentle Experiment),*  
Genome Quebec, Montreal  
Photograph, 40 in. x 50 in.,  
2014

**Figure 2**  
*Triangle (Cosmic Ray Experiment),*  
Pierre Auger Observatory, Malarçie  
Photograph, 40 in. x 50 in.,  
2015

**Figure 3**  
*Girdle (Cosmic Ray Experiment),*  
Pierre Auger Observatory, Malarçie  
Photograph, 40 in. x 50 in.,  
2015

## TABLE OF FIGURES

**Figure 4**  
*Ixos (Large Millimeter Array Experiment),*  
ALMA, San Pedro de Atacama  
Photograph, 40 in. x 50 in.,  
2015

**Figure 5**  
*Serenasars (Synchrotron Experiment),*  
Advanced Photon Source, Chicago  
Photograph, 40 in. x 50 in.,  
2017

**Figure 6**  
*Red Room (Quantum Experiment),*  
Institute for Quantum Computing, Waterloo  
Photograph, 40 in. x 50 in.,  
2016

## INTERPRETIVE GLOSSARY

### ABERRATION

A departure from what is normal, usual, or expected, typically one that is unwelcome.

### AETHER

The ancient Greek personification of the clear upper air of the sky.

### ARCHEAN

Denoting the era that constitutes the earlier (or middle) part of the Precambrian, in which there was no life on earth.

### BASAL GANGLIA

A group of structures linked to the thalamus in the base of the brain and involved in coordination of movement.

### BEMG

The nature or essence of a person or living creature.

### BETA-BLOCKER

Drugs that prevent the stimulation of the adrenergic receptors responsible for increased cardiac action.

### BIOSPHERE

The regions of the surface, atmosphere, and hydrosphere of the earth (or analogous parts of other planets) occupied by living organisms.

### BLACK HOLE

A region of space having a gravitational field so intense that no matter or radiation can escape.

### BRAIN

The portion of the vertebrate central nervous system enclosed in the skull and continuous with the spinal cord through the foramen magnum that is composed of neurons and supporting and nutritive structures and that integrates sensory information from inside and outside the body in controlling autonomic function, in coordinating and directing correlated motor responses, and in the process of learning.

### CAENORHABDITIS ELEGANS

A free-living, non-parasitic, transparent roundworm, about 1 mm in length, that lives in temperate soil environments.

### CELLULAR AUTOMATON

Consists of a regular grid of cells, each in one of a finite number of states, such as on and off.

### CEREBRUM

Responsible for the integration of complex sensory and neural functions and the initiation and coordination of voluntary activity.

### CHAOS

Complete disorder and confusion.

### CONSCIOUSNESS

The fact of awareness by the mind of itself and the world.

### COMPLEXITY

Consisting of parts intricately combined and difficult to analyze, understand or explain.

### CRISPR-Cas9

The protein Cas9 is an enzyme that acts like a pair of molecular scissors, capable of cutting strands of DNA.

### DARK ENERGY

A theoretical repulsive force that counteracts gravity and causes the universe to expand at an accelerating rate.

### DARK MATTER

Dark matter has not been directly observed, but its presence is implied in a variety of astrophysical observations, including gravitational effects that cannot be explained unless more matter is present than can be seen.

### ENTANGLE

To involve another in a perplexing or troublesome situation.

### EVOLUTION

Gradual inherited change in a population of organisms through time leading to the appearance of new forms

### EXPERIMENT

A scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a known fact.

### FEEDBACK LOOP

Feedback loops take a system output into consideration, which enables the system to adjust its performance to meet a desired output response.

### FORMALDEHYDE

Used in embalming to disinfect and temporarily preserve human remains pending final disposition.

### GALAXY

A system of millions or billions of stars, together with gas and dust, held together by gravitational attraction.

### GAS

An air like fluid substance which expands freely to fill any space available, irrespective of its quantity.

### GREAT OXYGENATION EVENT

Cyanobacteria triggered this event when they produced oxygen as early as 2.3 billion years ago.

### GREENHOUSE EFFECT

The greenhouse effect is the warming effect of the sun on greenhouse gases that act to trap this heat in our atmosphere.

### HEAVEN

The sky, especially perceived as a vault in which the sun, moon, stars, and planets are situated.

### HOLOGRAM

A three-dimensional image formed by the interference of light beams from a laser or other coherent light source.

### ILLUSION

A thing that is or is likely to be wrongly perceived or interpreted by the senses.

### IMAGINATION

The faculty or action of forming new ideas, or images or concepts of external objects not present to the senses.

### INFORMATION

What is conveyed or represented by a particular arrangement or sequence of things.

## Bibliography

- Alkhateeb, Ahmed. "Science Has Outgrown the Human Mind and Its Limited Capacities." *Aeon*. April 24, 2017. Accessed March 24, 2018. <http://aeon.com/ideas/science-has-outgrown-the-human-mind-and-its-limited-capacities>.
- Ball, Philip. "Changing your world view." *Nature* 438, no. 7070 (2005): 914-5.
- Barns, Barry and Bloor, David. "Relativism, rationalism and the sociology of knowledge." *Rationality and Relativism*. Edited by M. Hollis and S. Lukes, 21-47. Oxford: Basil Blackwell, 1982.
- Barthes, Roland. *Camera Lucida: Reflections on Photography*. Edited by Richard Howard. New York: Hill and Wang, 1981.
- Baudrillard, Jean. *Simulacra and simulation*. University of Michigan press, 1994.
- Becker, Howard S. "Photography and sociology." *Studies in Visual Communication* 1, no. 1 (1974): 3-26.
- Begley, Glenn C. and Lee, Ellis M. "Drug development: Raise standards for preclinical cancer research." *Nature* 483, no. 7391 (2012): 531-533.
- Benjamin, Walter. "One Way Street." In *Selected Writings, I: 1913-1926*, edited by Howard Eiland and Michael W. Jennings, 444-488. Cambridge, MA: Harvard University Press, 1996.
- Benjamin, Walter. *Understanding Brecht*. London: Verso, 1998.
- Bowker, Geoffrey C. "Data Flakes: An Afterword to 'Raw Data' Is an Oxymoron." In *"Raw Data" Is an Oxymoron*, 167-72. Cambridge, MA: MIT Press, 2013.
- Breed, Warren. "Social Control in the Newsroom: A Functional Analysis." *Social Forces* 33, No. 4 (May, 1955): 326-335.
- Bryant, Eric. "The Indecisive Image." *ARTnews*. March 1, 2008. Accessed March 24, 2018. <http://www.artnews.com/2008/03/01/the-indecisive-image/>.
- Burley, Robert. "Disappearance of Darkness Book Preview." 2012. Video. <https://vimeo.com/35389773>.
- Burtynsky, Edward. "My Wish: Manufactured Landscapes and Green Education." *TED.com*. Accessed March 24, 2018.
- Callon, Michel. "The role of lay people in the production and dissemination of scientific knowledge." *Science, Technology and Society* 4, no. 1 (1999): 81-94.
- Campbell, David. "Representing contemporary war." *Ethics & International Affairs* 17, no. 2 (2003): 99-108.
- Carnap, Rudolph. *Meaning and Necessity*. The University of Chicago Press, 1950.
- CERN: Accelerating Science. "Budget overview: Media and Press Relations." Accessed February 3, 2017 <https://press.cern/facts-and-figures/budget-overview>.
- CERN: Accelerating Science. "Computing." Accessed February 3, 2017. <https://home.cern/about/computing>.
- Cole, Teju. "Strangely Enough." *The New York Times*. October 18, 2016. Accessed April 18, 2018. <https://www.nytimes.com/2016/10/23/magazine/surreal-photography.html>.
- Crary, Jonathan. *24/7: Late Capitalism and the Ends of Sleep*. New York: Verso, 2013.
- Douglas, Heather. "Rejecting the Ideal of Value-Free Science." Edited by Harold Kincaid, John Dupre, and Alison Wylie. *Value-Free Science? Ideals and*

- Illusions*, 2007, 120-40.
- Edwards, Marc A., and Roy, Siddhartha. "Academic research in the 21st century: Maintaining scientific integrity in a climate of perverse incentives and hypercompetition." In *Environmental engineering science* 34, no. 1 (2017): 51-61.
- Eluard, Paul, Vitrac, Roger, and Boiffard, Jacques-André. "Préface." *La Révolution Surréaliste* 1, no. 1 (December 1924): 2-12.
- Estep, Jan. "Picture Making Meaning: An Interview with Jeff Wall." *Bridge Online* 2 (2003).
- Feenberg, Andrew. *Critical Theory of Technology*. Oxford University Press, 1991.
- Feenberg, Andrew. "Critical Theory of Technology: An Overview." In *Tailoring Biotechnologies* 1, no. 1 (2005): 47-64.
- Feyerband, Paul K. *Knowledge, Science and Relativism*. Cambridge University Press, 1999.
- Flusser, Vilém. *Towards a Philosophy of Photography*. London: Reaktion Books, 2000.
- Fontcuberta, Joan. "The artist and the photograph." *ZoneZero*. 2001. Retrieved 1 July 2008.
- Fortune 500 Companies - Archived List of Best Companies from 1995. Accessed April 17, 2018.  
[http://archive.fortune.com/magazines/fortune/fortune500\\_archive/full/1955/](http://archive.fortune.com/magazines/fortune/fortune500_archive/full/1955/).
- "Fortune 500 Companies 2017: Who Made the List." Fortune. Accessed April 17, 2018. <http://fortune.com/fortune500/list/>.
- Freedman, Russell. *Kids at work: Lewis Hine and the crusade against child labor*. Houghton Mifflin Harcourt, 1994.
- Galloway, Alexander. *The Interface Effect*. Cambridge: Polity, 2012.
- Geulincx, Arnold. *Arnoldi Geulincx ... Saturnalia, Seu (ut Passim Vocantur) Quæstiones Quodlibeticæ in Utramque Partem Disputatæ*. Lugduni Batavorum: Ex Officinâ Henrici Verbiest, 1665.
- Gitelman, Lisa. *Raw data is an oxymoron*. Boston: MIT Press, 2013.
- Graham-Harrison, Emma and Cadwalladr Carole. "Revealed: 50 Million Facebook Profiles Harvested for Cambridge Analytica in Major Data Breach." *The Guardian*, March 17, 2018. Accessed March 24, 2018.  
<https://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election>.
- Greenemeier, Larry. "Play to Cure: Genes in Space." *Scientific American*. February 18, 2015. Accessed March 24, 2018.  
<https://www.scientificamerican.com/citizen-science/play-to-cure-genes-in-space/>.
- Greenburg, Clement. *The Collected Essays and Criticism, Volume 2: Arrogant Purpose, 1945-1949*. Edited by John O'Brian. University of Chicago Press, 1988.
- Greenough, Sarah, and Stuart Alexander. *Looking In: Robert Frank's The Americans, Expanded Edition*. Washington, D.C.: National Gallery of Art, 2009.
- Harding, Sandra. "'Strong Objectivity': A Response to the New Objectivity Question." *Synthese* 104, no. 3 (Sept. 1995): 331-349.

- Haraway, Donna. "Situated Knowledges: The science question in feminism and the privilege of partial perspective." In *The Gender and Science Reader*, edited by Muriel Lederman and Ingrid Bartsch, 169-88. London: Routledge, 2001.
- Hartmann, Sadakichi. "A Plea for Straight Photography." In *Photography: Essays and Images*. Edited by Beaumont Newhall, 185-8. (New York: Museum of Modern Art, 1980.
- Hayeur, Isabelle. "Underworlds." Isabelle Hayeur : Photography. Accessed April 17, 2018. [https://isabelle-hayeur.com/photo\\_en.html](https://isabelle-hayeur.com/photo_en.html).
- Heidegger, Martin. *On Being and Time*. Translated by John Macquarrie and Edward Robinson. New York: Harper and Row, 1962.
- Heidegger, Martin. "The question concerning technology." In *The Question Concerning Technology and Other Essays*, translated by William Lovitt, 3-35. New York: Garland Publishing: 1977.
- Hindman, Hugh. *Child Labor: An American History*. M.E. Sharpe, 2002.
- Hine, Lewis. "488 Macon, Ga. Lewis W. Hine 1-19-1909. Bibb Mill No. 1." Library of Congress. January 01, 1970. Accessed May 02, 2018. <https://www.loc.gov/pictures/item/ncl2004001388/PP/>.
- Johnson, Ken. "Joan Fontcuberta 'Constellations.'" *The New York Times*. January 30, 1998. Accessed March 24, 2018. <http://www.nytimes.com/1998/01/30/arts/art-in-review-335924.html>.
- Johnson, Neil, Guannan Zhao, Eric Hunsader, Hong Qi, Nicholas Johnson, Jing Meng, and Brian Tivnan. "Abrupt rise of new machine ecology beyond human response time." *Scientific reports* 3 (2013): 2627.
- Kassin, Saul M., Itiel E. Dror, and Jeff Kukucka. "The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions." *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 42-52.
- Kober, George M. "The Physical and Physiological Effects of Child Labor." *The ANNALS of the American Academy of Political and Social Science* 27, no. 2 (1906): 27-30.
- Klein, William. "Bernd and Hilla Becher." *Contacts Volume 3: Portraits of Contemporary Photographers*. Video, 7:58. Accessed March 24, 2018. <https://www.americansuburbx.com/2011/02/asx-tv-bernd-hilla-becher-contacts-vol-3-2010.html>.
- Krauss, Rosalind E. *Lamour Fou: Photography and Surrealism*. Washington, D.C.: Corcoran Gallery of Art, 1985.
- Kuhn, Thomas S. *The Structure of Scientific Revolutions*. University of Chicago Press, 1962.
- Later, Paul. "Thomas Struth's New Photos Stare Death in the Face." *Vice Garage*. Nov 14, 2017. Accessed March 24, 2018. [https://garage.vice.com/en\\_us/article/evb8nk/thomas-struth-new-photos-marian-goodman-gallery/](https://garage.vice.com/en_us/article/evb8nk/thomas-struth-new-photos-marian-goodman-gallery/).
- Latour, Bruno. "Give me a laboratory and I will raise the world." In *Science Observed* 141 (1983).
- Latour, Bruno, and Steve Woolgar. *Laboratory Life: The Construction of Scientific Facts*. New Jersey: Princeton University Press, 1986.
- Longino, Helen. "Beyond "Bad Science": Skeptical Reflections on the Value-Freedom

- of Scientific Inquiry." *Science, Technology & Human Values* 8, no. 1 (1983): 7-17.
- Marcuse, Herbert, and Douglas Kellner. *Technology, War and Fascism: Collected Papers of Herbert Marcuse*. London: Routledge, 1998.
- Marien, Mary Warner. *Photography: A cultural history*. Laurence King Publishing, 2006.
- Max Frisch. *Homo Faber*. Translated by Michael Bullock. London: Abelard-Shuman, 1959.
- Marcuse, Herbert. *One Dimensional Man*. Boston: Beacon, 1964.
- McLaughlin, Bryne. "Lynne Cohen: Space Invader." *Canadian Art*. June 2, 2011. Accessed March 25, 2018. [https://canadianart.ca/features/lynne\\_cohen/](https://canadianart.ca/features/lynne_cohen/).
- Murata, Hanako. "Material Forms in Nature: The Photographs of Karl Blossfeldt." In *Object:Photo. Modern Photographs: The Thomas Waither Collection 1909-1949. An Online Project of the Museum of Modern Art* (New York: Moma, 2014).
- Marsland, Stephen. *Machine Learning: an algorithmic perspective*. USA: Chapman & Hall/CRC, 2009.
- Marx, Karl. "Capital Vol. 1, Chapter Fourteen: Division of Labour and Manufacture." *Marxist.org*. Accessed March 24, 2018. <https://www.marxists.org/archive/marx/works/1867-c1/ch14.htm>.
- Minh-Ha, Trinh T. "Documentary is/not a name." *October* 52 (1990): 77-98.
- Mitchell, Sandra. "Why integrated pluralism?" *E:CO* 6, no. 1-2 (2004): 81-91.
- Morin, A., J. Urban, P. D. Adams, I. Foster, A. Sali, D. Baker, and P. Sliz. "Shining light into black-boxes." *Science* 336, no. 6078 (2012): 159-160.
- Neimark, Jill. "The Retraction War." *Aeon.com*. December 23, 2014. Accessed March 24, 2018. <https://aeon.co/essays/are-the-retraction-wars-a-sign-that-science-is-broken>.
- Phillips, Christopher. "The Judgment Seat of Photography." *October* 22 (Autumn, 1982): 27-63.
- Pitman, Nigel. "Six Pictures of Paradise - Issue 14: Mutation." *Nautilus*. Accessed March 24, 2018. <http://www.nautil.us/issue/14/mutation/six-pictures-of-paradise>.
- Plantinga, Carl. "What a documentary is, after all." *The Journal of Aesthetics and Art Criticism* 63, no. 2 (2005): 105-117.
- Polanyi, Michael. *The Tacit Dimension*. University of Chicago Press, 2009.
- Rehel, Jason. "Q&A: Edward Burtynsky on Oil." *National Post*. 12 Apr. 2011. Web. 12 Aug. 2017.
- Rees, Martin. "Black Holes Are Simpler than Forests and Science Has Its Limits." *Aeon*. December 1, 2017. Accessed March 24, 2018. <https://aeon.co/ideas/black-holes-are-simpler-than-forests-and-science-has-its-limits>.
- Rein, Lisa. "Here Are the Photos That Show Obama's Inauguration Crowd Was Bigger than Trump's." *The Washington Post*. WP Company, March 7, 2017. Accessed March 24, 2018. <https://www.washingtonpost.com/news/powerpost/wp/2017/03/06/here>



- are-the-photos-that-show-obamas-inauguration-crowd-was-bigger-than-trumps/?utm\_term=.dc48b564ac97
- "Retouch and Repair Photos." Adobe Help Center. Accessed April 25, 2018. <https://helpx.adobe.com/uk/photoshop/using/retouching-repairing-images.html>.
- Schmeltzer, Paul. "Visualizing American Power." *Walker Art Center*. October 16, 2013. Accessed March 24, 2018. <https://walkerart.org/magazine/mitch-epstein-paul-shambroom-american-power>.
- Seixas, Peter. "Lewis Hine: From 'social' to 'interpretive' photographer." *American Quarterly* 39, no. 3 (1987): 381-409.
- Simon, Taryn. "Photographs of Secret Sites." *TED.com*. Accessed Aug. 16, 2017.
- Smyth, Diane. "From the BJP Archive: Thomas Ruff." *British Journal of Photography*. September 27, 2017. Accessed March 24, 2018. <http://www.bjp-online.com/2017/08/from-the-bjp-archive-thomas-ruff/>.
- Solaroli, Marco. "Toward A New Visual Culture Of The News: Professional photojournalism, digital post-production, and the symbolic struggle for distinction." *Digital Journalism* 3, no. 4 (2015): 513-532.
- Sontag, Susan. *Regarding the Pain of Others*. New York: Farrar, Straus, and Giroux, 2003.
- Tausk, Victor. "On the Origin of the 'Influencing Machine' in Schizophrenia." *The Psychoanalytic Quarterly* 2, no. 3-4 (1933): 519-556.
- Truscello, Michael. "The New Topographics, Dark Ecology, and the Energy Infrastructure of Nations: Considering Agency in the Photographs of Edward Burtynsky and Mitch Epstein from a Post-Anarchist Perspective." *Imaginations: Journal of Cross-Cultural Image Studies (ARCHIVES)* 3, no. 2 (2016): 188-205.
- Vallone, Robert P., Lee Ross, and Mark R. Lepper. "The hostile media phenomenon: biased perception and perceptions of media bias in coverage of the Beirut massacre." *Journal of personality and social psychology* 49, no. 3 (1985): 577-585.
- Van Noorden, Richard. "Scientists May Be Reaching a Peak in Reading Habits." *Nature News*. Nature Publishing Group. February 3, 2014. Accessed March 24, 2018. <http://www.nature.com/news/scientists-may-be-reaching-a-peak-in-reading-habits-1.14658>.
- Virilio, Paul. *The Original Accident*. Cambridge: Polity, 2007.
- Virilio, Paul. *Politics of the Very Worst*. New York: Semiotext(e), 1999.
- Wall, Jeff. *Picture for Women*, 1979. Cibacrome print mounted on lightbox, 204.5 x 142.5 cm. Paris, Centre Georges Pompidou.
- Wall, Mike. "Conspiracy Debunked: NASA Photoshops Images for Good Reason." *Space.com*. October 15, 2010. Accessed March 24, 2018. <https://www.space.com/9337-conspiracy-debunked-nasa-photoshops-images-good-reason.html>.
- Winner, Langdon. "Upon Opening the Black-Box and Finding it Empty: Social Constructivism and the Philosophy of Technology." *Science, Technology, & Human Values* 18, no. 3 (1993): 362-378.
- Winterich, Karen Page, Rebecca Walker Reczek, and Julie R. Irwin. "Keeping the

- Memory but Not the Possession: Memory Preservation Mitigates Identity Loss from Product Disposition." *Journal of Marketing* 81, no. 5 (2017): 104-120.
- Wylie, Alison. "Why Standpoint Matters." *Science and other cultures: Issues in philosophies of science and technology*, edited by Sandra Harding, 26-48. London: Routledge, 2003.
- Zaloom, Caitlin. *Out of the pits: Traders and technology from Chicago to London*. University of Chicago Press, 2006.
- Zimonjic, Peter. "Found Places: The Photography of Lynn Cohen." *National Gallery of Canada*. April 11, 2014. Accessed March 24, 2018.  
<https://www.gallery.ca/magazine/exhibitions/found-places-the-photography-of-lynn-cohen>.

## Appendices

### Exhibition Documentation

*Instrumental*, Artlab Gallery, London, Ontario, 2016.

Details:

Photographs: 40"x50"; Mural: 8'x8';

Installation: Particle Experiment (Geneva); Photo Panels I-IV (Sizes: 19"x75" each);

Microcontrollers; Audio;

Installation: UTSIC Collection [The Future Past]; 8"x10" prints; Microcontroller; Fog Machine.

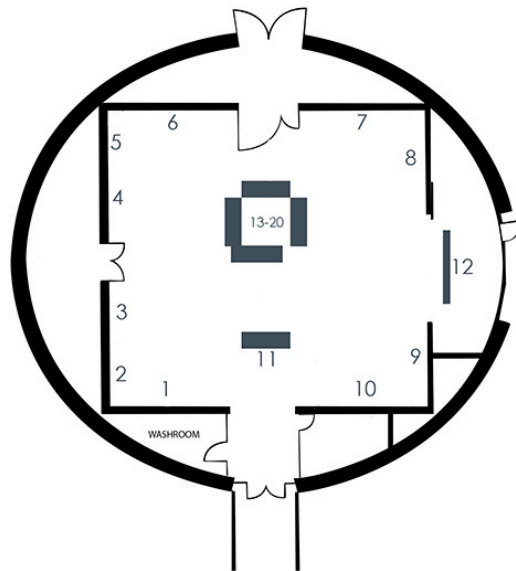
#### INSTRUMENTAL

Mark Kasumovic

1. Be Gentle (Quantum Experiment), 40"x50", 2015
2. Mobile Workstation (Radio Telescope Experiment) 40"x50", 2015
3. Vault #3 (Global Seed Storage Facility), 40"x50", 2014
4. Foxes (Radio Telescope Experiment), 40"x50", 2015
5. Fish Lab Glove Rack (Lake Experiment), 40"x50", 2015
6. Phosphorus Pour (Lake Experiment), 40"x50", 2015
7. Blue Room (Cosmic Ray Experiment), 40"x50", 2015
8. Remote Control (Space Robotics Experiment), 40"x50", 2014
9. Daguerreotype (Beam Line Experiment), 40"x50", 2016
10. Push to Exit (Beam Line Experiment), 40"x50", 2016
11. Orange room (Quantum Experiment), 40"x50", 2015
12. Server Room (Particle Experiment), 18" x 72", 4 Panels, 2016

#### Clockwise from entrance

13. Eye Model (Engineering Psychology), 2016
14. LEEP Video System (Engineering Psychology), 2016
15. Nervous System [DAMAGED] (uncategorized), 2016
16. Light Bulb (uncategorized), 2016
17. HYPERTRON Reference Manuals (uncategorized), 2016
18. Wooden Maze (Psychology), 2016
19. Motion Films (uncategorized), 2016
20. Psychology Test (uncategorized), 2016

















*Instrumental*, Art Gallery of Mississauga, Mississauga, Ontario, 2016 (Photographs courtesy of Toni Hafkenscheid).

Details:

Satellite Experiment (Chile), Mural and Floating Frame;

Mural Size: 12'x10'; Frame Size: 19"x70";

Particle Experiment (Geneva); Photo Panels I-IV (Sizes: 19"x75" each);

Medium: Photo Installation [5 panels]; Inkjet on Vinyl; Wood Frame;

Date: 2016.







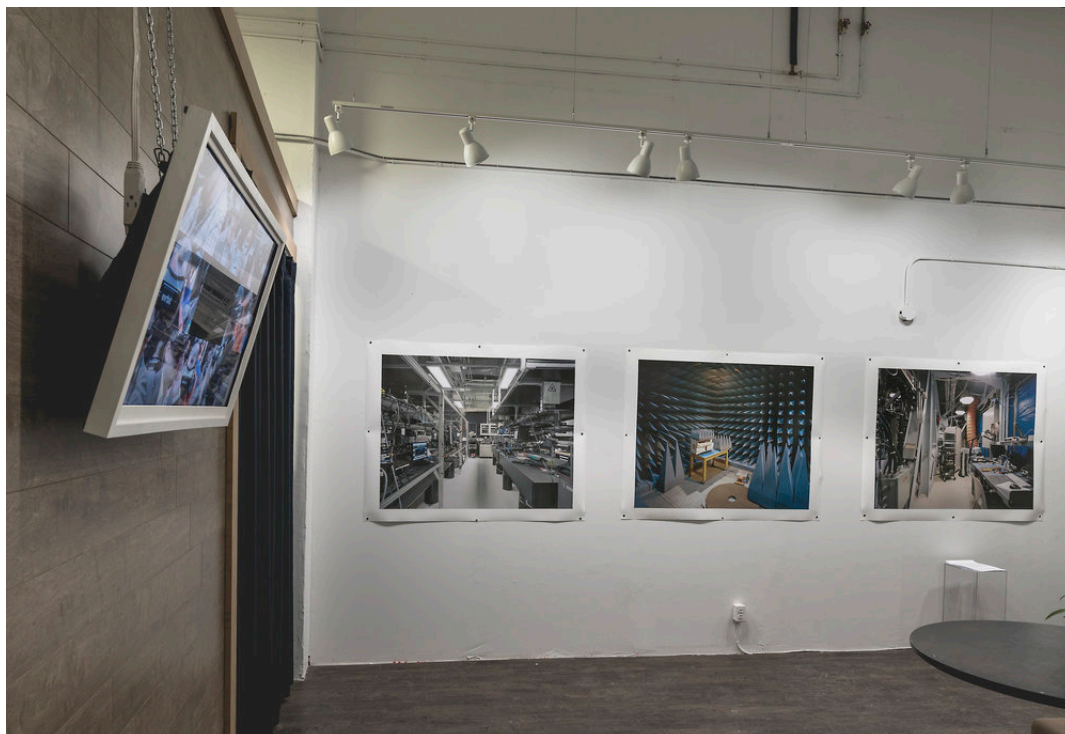
*Instrumental II*, Double Happiness Projects, Toronto, Ontario, 2018 (Images courtesy of Double Happiness Projects).

Details:

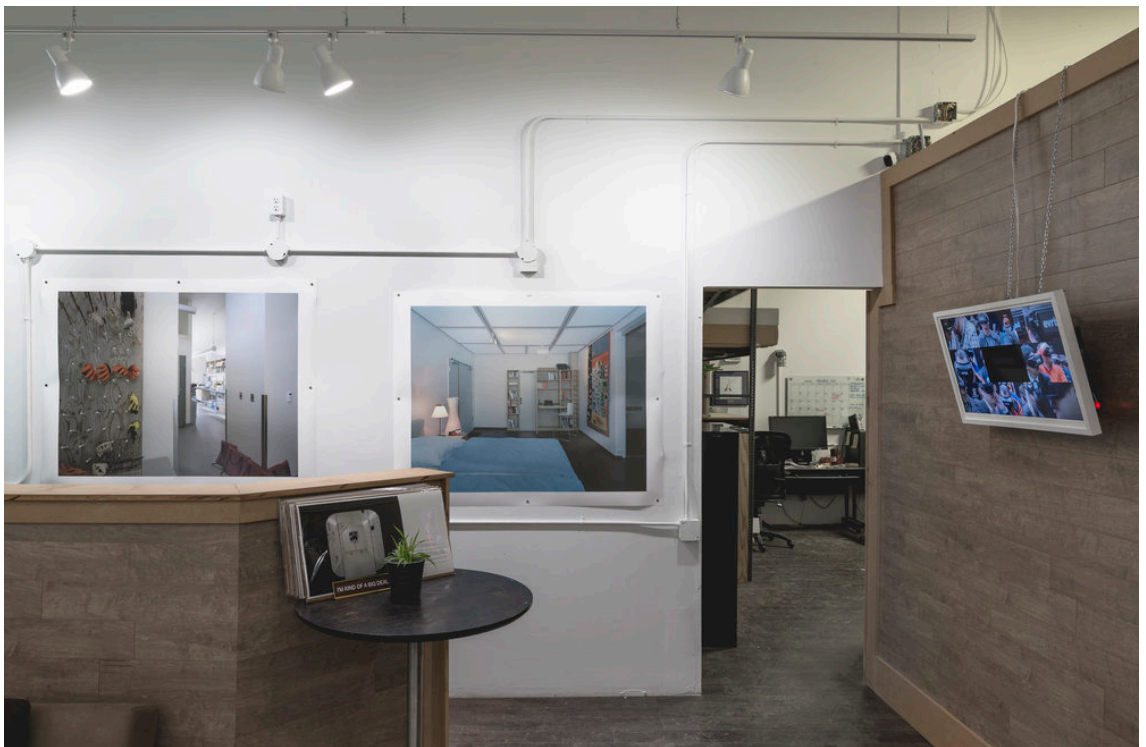
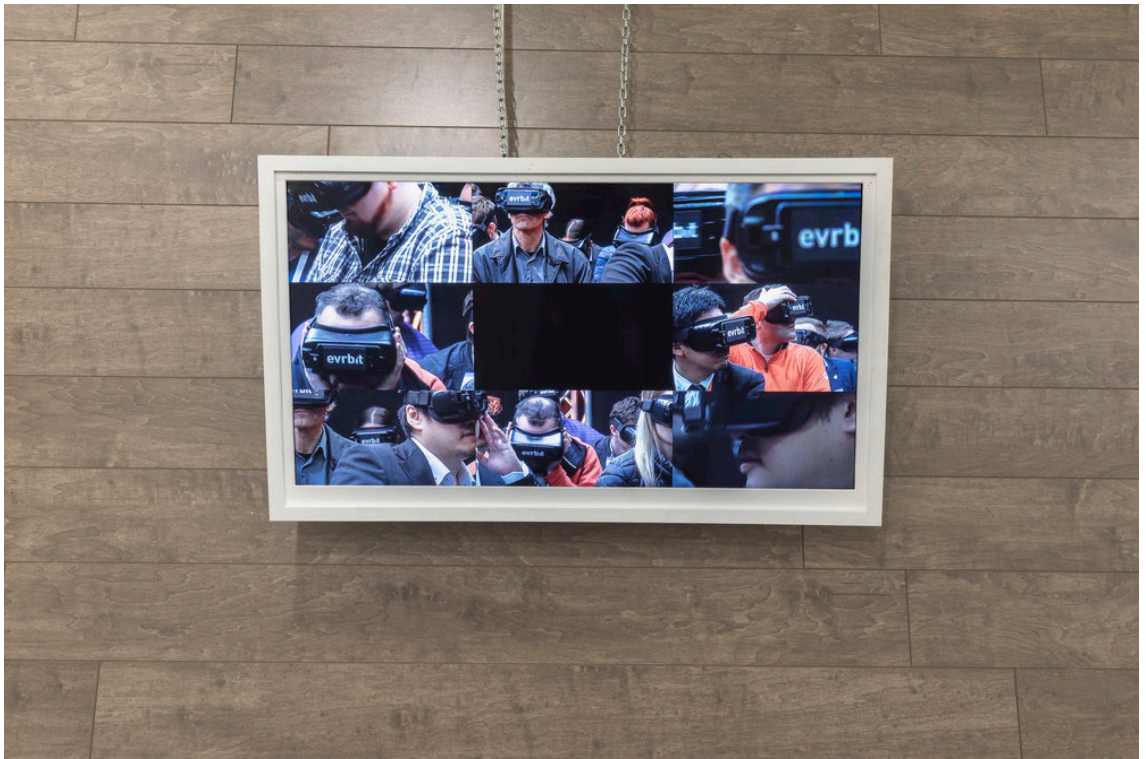
Photographs; Sizes: 40x50 in. each;

Medium: Inkjet on Canson Infinity Fibre Rag;

Video: Single Channel Video, 10 min. loop;







*A Human Laboratory*, McIntosh Gallery, London, Ontario, 2018.

Details:

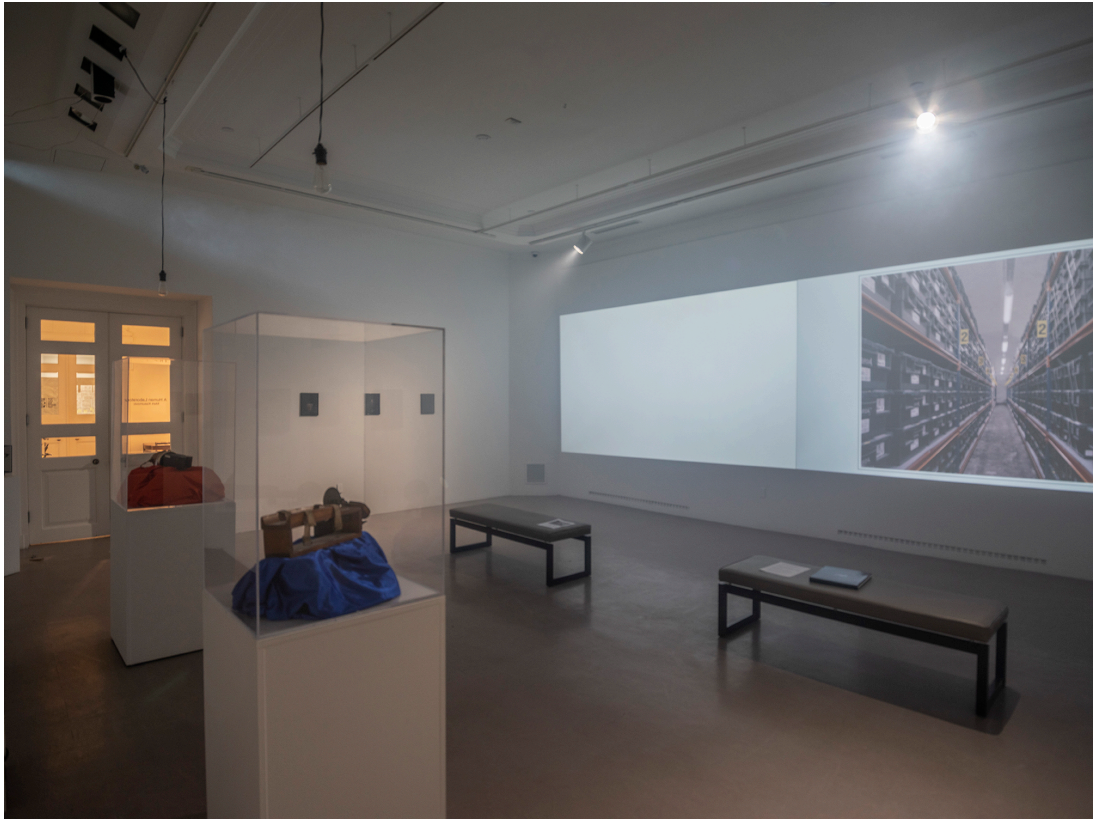
Two-Channel Video (60 min. loop); Interactive Lighting and Fogger;  
Objects from the UTSIC Collection: Arm Restrainer, Mask for Vision Constriction and  
Rosenzweig Picture Frustration Study;  
Photographs: 8x10", Murals: Sizes Vary (Inkjet on Vinyl).



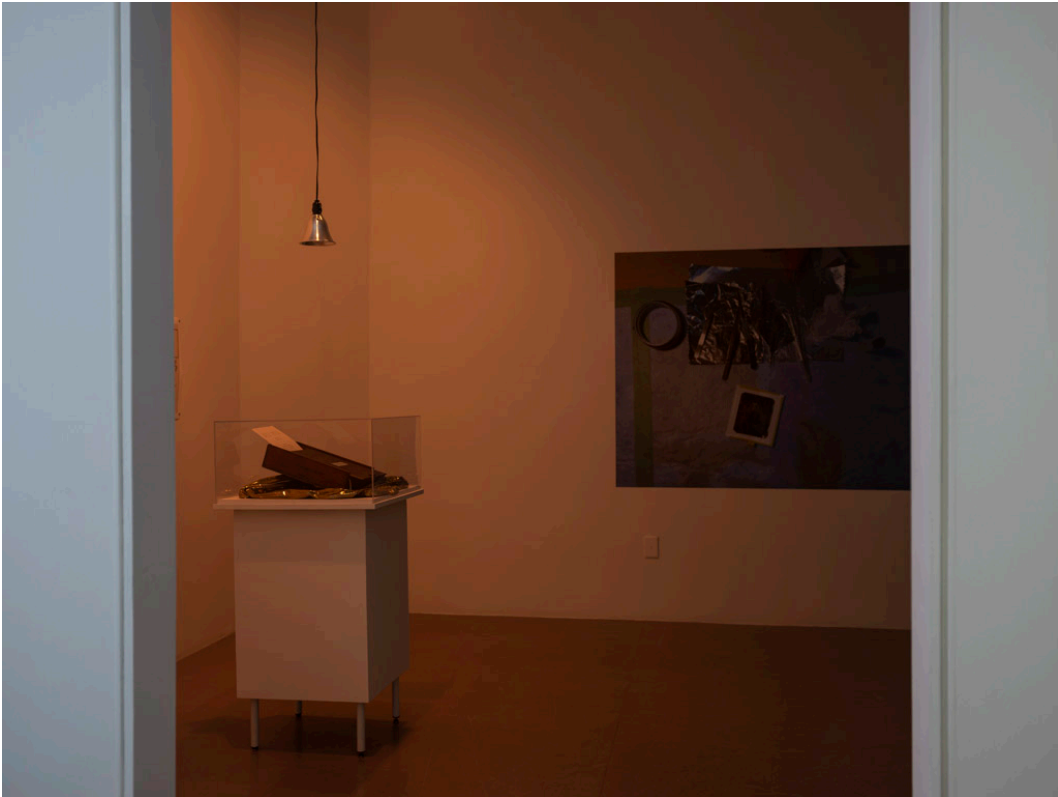


















## List of Site Visits

The Atacama Large Millimeter Array;  
Biotron research centre;  
The Center for Nuclear Research;  
University of Waterloo Centre for Quantum Computing;  
University of Waterloo Laser Laboratory;  
University of Waterloo Anechoic Chamber;  
German Institute for Artificial Intelligence (DFKI);  
Bremen Ambient Assisted Living Laboratory;  
Innovative Retail Laboratory;  
Robotics Exploration Laboratory;  
SmartFactory Laboratory;  
SmartCity Living Lab;  
Genome Quebec;  
University of Guelph Phytotron;  
Pierre Auger Observatory;  
Svalbard Global Seed Vault;  
SVALSAT Norway;  
The Western University Data Centre,  
WindEEE centre;  
University of Toronto Scientific Instrument Collection;  
Advanced Photon Source;  
CSIRO;  
ATNF Parkes Radio Observatory;  
University of Alaska Fairbanks International Arctic Research Center (IARC);  
IISD Experimental Lakes Area;  
Rottneft Field Station;  
Argonne National Laboratory;  
Sudbury Neutrino Observatory Laboratory (SNOLAB);  
University of New South Wales Herbarium;  
University of New South Wales Evolutionary Biology Lab;  
Canberra Deep Space Communications Complex of NASA's Deep Space Network;  
University of New South Wales Quantum Computing Centre.

## Curriculum Vitae

**Name:** Mark Kasumovic

**Post-secondary Education and Degrees:** BFA Image Arts (Photography)  
Ryerson University  
Toronto, Ontario, Canada  
2005-2009

MFA Fine and Media Arts  
NSCAD University  
Halifax, Nova Scotia, Canada  
2010-2012

Ph.D. Fine Arts and Visual Communication  
The University of Western Ontario  
London, Ontario, Canada  
2013-2018

**Thesis Related Honours and Awards:** Western Graduate Research Scholarship, 2013, 2014  
Ontario Graduate Scholarship, 2014

Alumni Graduate Award, 2014, 2015

Junior Visiting Research Fellow, University of New South Wales  
School of Biological, Earth and Environmental Sciences  
Faculty of Science, 2016

Social Sciences and Humanities Research Council (SSHRC)  
Michael Smith Foreign Study Supplement, 2016

Mary Routledge Fellowship, Western University, 2016

Canadian Polar Commission  
Northern Science Training Fellowship, 2016

Social Sciences and Humanities Research Council (SSHRC)  
CGS Doctoral Scholarship, 2015-2018



**Thesis Related**      ArtLAB Gallery, London, Ontario

**Artist Exhibitions:** *Instrumental I*, 2016

Art Gallery of Mississauga, Ontario

*Instrumental I*, 2016

DHP (Double Happiness Projects), Toronto, Ontario

*Instrumental II*, 2018

McIntosh Gallery, London, Ontario

*A Human Laboratory*, 2018